

---

# SPECIFICATION

FOR CONSTRUCTION CONTRACT

VA Project No: 695-13-111

---

Building 6 FCA Deficiency Corrections

Clement J. Zablocki VA Medical Center

Milwaukee, Wisconsin



---

05 February 2014



**DEPARTMENT OF VETERANS AFFAIRS  
VHA MASTER SPECIFICATIONS**

**TABLE OF CONTENTS  
Section 00 01 10**

	<b>DIVISION 00 - SPECIAL SECTIONS</b>	<b>DATE</b>
00 01 15	List of Drawing Sheets	09-11
	<b>DIVISION 01 - GENERAL REQUIREMENTS</b>	
01 00 00	General Requirements	09-13
01 01 10-FSS	Fire Safety Sectionn	12-11
01 01 10-SN	Special Notes	02-13
01 32 16.13	Network Analysis Schedules	03-11
01 32 16.15	Project Schedules (Small Projects - Design/Bid/Build	04-13
01 33 23	Shop Drawings, Product Data, and Samples	11-08
01 42 19	Reference Standards	09-11
01 57 19	Temporary Environmental Controls	01-11
01 74 19	Construction Waste Management	09-13
01 81 11	Sustainable Design Requirements	02-13
	<b>DIVISION 02 - EXISTING CONDITIONS</b>	
02 42 00	Cutting, Removal, Demolition, Restoration and Patching	
02 83 33.13	Lead-Based Paint Removal and Disposal	08-11
	<b>DIVISION 03 - CONCRETE</b>	
03 30 53	(Short-Form) Cast-in-Place Concrete	10-12
	<b>DIVISION 04 - MASONRY</b>	
04 05 13	Masonry Mortaring	09-11
04 05 31	Masonry Tuck Pointing	08-11
04 50 00	Masonry Restoration & Cleaning	
	<b>DIVISION 05 - METALS</b>	
05 50 00	Metal Fabrications	09-11
	<b>DIVISION 06 - WOOD, PLASTICS AND COMPOSITES</b>	
06 10 00	Rough Carpentry	09-11
	<b>DIVISION 07 - THERMAL AND MOISTURE PROTECTION</b>	
07 60 00	Flashing and Sheet Metal	10-10
07 92 00	Joint Sealants	12-11
	<b>DIVISION 08 - OPENINGS</b>	

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

09-01-13

08 59 00	Wood Window Restoration	
08 71 00	Door Hardware	09-11
08 80 00	Glazing	10-12
	<b>DIVISION 09 - FINISHES</b>	
09 90 00	Painting	
	<b>DIVISION 32 - EXTERIOR IMPROVEMENTS</b>	
32 05 23	Cement and Concrete for Exterior Improvements	05-13

**SECTION 00 01 15**  
**LIST OF DRAWING SHEETS**

The drawings listed below accompanying this specification form a part of  
the contract.

<u>Drawing No.</u>	<u>Title</u>
G100	TITLE SHEET, PROJECT INFORMATION AND SHEET INDEX
A100	OVERALL BUILDING PLAN W/ SCOPE NOTES
A101	OVERALL BUILDING PLAN W/ PHOTO REFERENCES
A200	EXISTING BUILDING PHOTOS W/ SCOPES OF WORK
A201	EXISTING BUILDING PHOTOS W/ SCOPES OF WORK
A202	EXISTING BUILDING PHOTOS W/ SCOPES OF WORK
A203	TUCKPOINTING LOCATIONS - 'A' WING & 'B' WING
A203	TUCKPOINTING LOCATIONS - 'C' WING NORTH
A204	TUCKPOINTING LOCATIONS - 'C' WING SOUTH & 'D' WING
A300	'A' WING & 'B' WING LOWER LEVEL & 1 <sup>ST</sup> FLOOR - DOOR & WINDOW REFERENCE PLANS
A301	'A' WING & 'B' WING 2 <sup>ND</sup> FLOOR & ROOF LEVEL - DOOR & WINDOW REFERENCE PLANS
A302	'C' WING & 'D' WING LOWER LEVEL & 1 <sup>ST</sup> FLOOR - DOOR & WINDOW REFERENCE PLANS
A303	'C' WING & 'D' WING 2 <sup>ND</sup> , 3 <sup>RD</sup> & ROOF LEVEL - DOOR & WINDOW REFERENCE PLANS
A304	DOOR SCHEDULE & DOOR TYPES
A305	DOOR TYPES
A306	WINDOW SCHEDULE & WINDOW TYPES
A307	WINDOW TYPES
A400	STAIR REPLACEMENT PLANS & ELEVATIONS
A401	DETAILS

- - - END - - -

**SECTION 01 00 00  
GENERAL REQUIREMENTS**

**TABLE OF CONTENTS**

1.1 GENERAL INTENTION.....	1
1.2 STATEMENT OF BID ITEM(S) .....	2
1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR.....	2
1.4 CONSTRUCTION SECURITY REQUIREMENTS.....	3
1.5 FIRE SAFETY.....	4
1.6 OPERATIONS AND STORAGE AREAS.....	7
1.7 ALTERATIONS.....	10
1.8 INFECTION PREVENTION MEASURES.....	11
1.9 DISPOSAL AND RETENTION.....	11
1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.....	12
1.11 RESTORATION.....	12
1.12 PHYSICAL DATA.....	13
1.13 PROFESSIONAL SURVEYING SERVICES.....	13
1.14 LAYOUT OF WORK.....	13
1.15 AS-BUILT DRAWINGS.....	13
1.16 USE OF ROADWAYS.....	14
1.17 COR'S FIELD OFFICE.....	14
1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT.....	14
1.19 TEMPORARY USE OF EXISTING ELEVATORS.....	14
1.20 TEMPORARY USE OF NEW ELEVATORS.....	14
1.21 TEMPORARY TOILETS.....	14
1.22 AVAILABILITY AND USE OF UTILITY SERVICES.....	14
1.23 NEW TELEPHONE EQUIPMENT.....	15
1.24 TESTS.....	15

09-01-13

1.25 INSTRUCTIONS.....	15
1.26 GOVERNMENT-FURNISHED PROPERTY.....	16
1.27 RELOCATED ITEMS.....	16
1.28 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT.....	16
1.29 CONSTRUCTION SIGN.....	16
1.30 SAFETY SIGN.....	17
1.31 PHOTOGRAPHIC DOCUMENTATION.....	17
1.32 FINAL ELEVATION Digital Images.....	17
1.33 HISTORIC PRESERVATION.....	17
1.34 TEMPORARY INTERIOR SIGNAGE.....	17

**SECTION 01 00 00**  
**GENERAL REQUIREMENTS**

**1.1 GENERAL INTENTION**

- A. Contractor shall completely prepare site for building operations, including demolition and removal of existing items, and furnish labor, materials, equipment, tools, supervision and all other necessary resources to perform the work for Building 6 FCA Deficiency Corrections as required by drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center COR.
- C. Offices of Chequamegon Bay Group, as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer.
- D. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- E. Prior to commencing work, general contractor shall provide proof that a OSHA designated "competent person" (CP) (29 CFR 1926.20(b)(2)) shall maintain a presence at the work site any time work is being performed.
- F. Training:
  - 1. All employees of general contractor or subcontractors shall have the 10-hour or 30-hour OSHA Construction Safety course and other relevant competency training, as determined by COR acting as the Construction Safety Officer with input from the facility Construction Safety Committee.
  - 2. Submit training records of all such employees for approval before the start of work.
- G. VHA Directive 2011-36, Safety and Health during Construction, dated 9/22/2011 in its entirety is made a part of this section

## **1.2 STATEMENT OF BID ITEM(S)**

- A. BASE BID - GENERAL CONSTRUCTION: Work includes exteriors, windows, doors, and tuckpointing to upgrade the exterior of Building 6. All work will be accomplished within 450 days after receipt of the notice to proceed.
- B. ALTERNATE BID ITEM 1:  
All work in BASE BID, minus window and door work for 'D' Wing and 'CD' Connector. Repair of stairs and railings on 'D' Wing and 'CD' Connector to remain in the project. All work will be accomplished within 430 days after receipt of the notice to proceed.
- C. ALTERNATE BID ITEM 2:  
All work in ALTERNATE BID ITEM 1, minus all masonry work (cleaning, repair, tuckpointing, paint removal) for 'D' Wing and 'CD' Connector. All work will be accomplished within 410 days after receipt of notice to proceed.
- D. ROUTINE INSPECTIONS AND MAINTENANCE DURING CONSTRUCTION
- a. Provide routine inspections and maintenance services as prescribed in Operations & Maintenance manuals required under this contract.
  - b. Provide services during construction and until items below are completed:
    - i. VA Inspection complete.
    - ii. Training of VA Maintenance staff
    - iii. O&M Manual submittals received, reviewed, and approved by VA.
- E. PHASING: Phasing to be included in this project. Phase 1 will be submittals review. Duration to be based on AE determination of submittals required prior to work beginning, and time to review these. Phase 2 will be construction.

## **1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR**

- A. All drawings and specifications will be on FedBizOps and Buzzsaw for contractor use.
- B. In the case of conflicts or discrepancies within or among the Contract Drawings, the better quality, more stringent requirements or greater quantity of work, as determined by the Government, shall be provided..

#### **1.4 CONSTRUCTION SECURITY REQUIREMENTS**

##### **A. Security Plan:**

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

##### **B. Security Procedures:**

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer.
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

##### **C. Guards:**

1. The General Contractor shall provide unarmed guards at the project site after construction hours as needed.
2. The guard shall have communication devices to report events as directed by VA police.
3. The general Contractor shall install equipment for recording guard rounds to ensure systematic checking of the premises.

D. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COR for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

E. Document Control:

1. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
2. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.

F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.
2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

**1.5 FIRE SAFETY**

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2009.....Surface Burning Characteristics of Building  
Materials

2. National Fire Protection Association (NFPA):

10-2010.....Standard for Portable Fire Extinguishers

30-2008.....Flammable and Combustible Liquids Code

51B-2009.....Standard for Fire Prevention During Welding,  
Cutting and Other Hot Work

05-01-13

70-2011.....National Electrical Code

241-2009.....Standard for Safeguarding Construction,  
Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926.....Safety and Health Regulations for Construction

- B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to COR for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the COR that individuals have undergone contractor's safety briefing.
- C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with COR.
- G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COR.

05-01-13

- H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- J. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with COR and facility Safety Manager. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COR.
- K. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer. Obtain permits from facility Safety Manager. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
- L. FireHazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COR.
- M. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- N. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- O. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.
- P. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

## **1.6 OPERATIONS AND STORAGE AREAS**

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. Working space and space available for storing materials shall be as determined by the COR.
- E. Workmen are subject to rules of Medical Center applicable to their conduct.
- F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly

05-01-13

by patients or medical personnel, and Contractor's personnel, except as permitted by COR where required by limited working space.

1. Do not store materials and equipment in other than assigned areas.
2. Provide unobstructed access to Medical Center areas required to remain in operation.

G. Phasing: To insure such executions, Contractor shall furnish the COR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the COR two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such phasing dates to insure accomplishment of this work in successive phases mutually agreeable to Medical Center Director, COR and Contractor.

H. Building No.(s) 6 will be occupied during performance of work.

I. Construction Fence: Before construction operations begin, Contractor shall provide a chain link construction fence, 2.1m (seven feet) minimum height, around the construction area indicated on the drawings. Fence shall not be physically attached to the building. Provide gates as required for access with necessary hardware, including hasps and padlocks. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 375mm (15 inches). Bottom of fences shall extend to 25mm (one inch) above grade. Remove the fence when directed by COR.

J. When a building is turned over to Contractor, Contractor shall accept entire responsibility therefore.

1. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.

K. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes,

05-01-13

or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director's prior knowledge and written approval.
  2. Contractor shall submit a request to interrupt any such services to COR, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
  3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
  4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the COR.
  5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.
- L. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
  2. Method and scheduling of required cutting, altering and removal of existing walks and entrances must be approved by the COR.

05-01-13

3. Provide protection of building occupants (including overhead) at each building entrance and exit. Entrances and exits shall remain protected and accessible for duration of work impacting the area adjacent to each door.

M. Coordinate the work for this contract with other concurrent construction projects at Building 6 and elsewhere on campus as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

### **1.7 ALTERATIONS**

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both, to the Contracting Officer. This report shall list by area:

1. Any discrepancies between drawings and existing conditions at site.

B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR, to be in such condition that their use is impossible or impractical, shall be documented in the survey report. The COR or COR's agent shall submit the documentation to the State Historic Preservation Office (SHPO) for their consideration. Pending acceptance by the SHPO, these items shall be furnished and/or replaced by Contractor with new items in accordance with specifications furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" and "CHANGES".

C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:

1. Re-survey report shall also list any damage caused by Contractor to surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
3. Protection of building occupants (including overhead) at each building entrance and exit. Entrances and exits shall remain protected and accessible for duration of work impacting the area adjacent to each door.

**1.8 INFECTION PREVENTION MEASURES: NOT APPLICABLE**

**1.9 DISPOSAL AND RETENTION**

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by COR.
2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

**1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS**

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

**(FAR 52.236-9)**

- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

**1.11 RESTORATION**

- A. Remove, cut, alter, replace, patch and repair existing work as specified and without damage to adjacent historic materials. Where the erection of scaffolding is necessary to perform the work, scaffolding must be free-standing and self-supporting. Securing of scaffolding to building shall not be permitted. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be

05-01-13

defective in any way, shall be reported to the COR before it is disturbed. Materials and workmanship used in restoring work shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

**1.12 PHYSICAL DATA: NOT APPLICABLE**

**1.13 PROFESSIONAL SURVEYING SERVICES: NOT APPLICABLE**

**1.14 LAYOUT OF WORK: NOT APPLICABLE**

**1.15 AS-BUILT DRAWINGS**

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COR's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the COR within 15 calendar days after each completed phase and after the acceptance of the project by the COR.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

**1.16 USE OF ROADWAYS**

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

**1.17 COR'S FIELD OFFICE: NOT APPLICABLE**

**1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT: NOT APPLICABLE**

**1.19 TEMPORARY USE OF EXISTING ELEVATORS**

- A. Contractor will not be allowed the use of existing elevators. Outside type hoist shall be used by Contractor for transporting materials and equipment.

**1.20 TEMPORARY USE OF NEW ELEVATORS: NOT APPLICABLE**

**1.21 TEMPORARY TOILETS**

- A. Provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by COR, provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

**1.22 AVAILABILITY AND USE OF UTILITY SERVICES**

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.
- D. Electricity (for Construction and Testing): Furnish all temporary electric services.
  - 1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.
- E. Water (for Construction and Testing): Furnish temporary water service.
  - 1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
  - 2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COR's discretion) of use of water from Medical Center's system.

**1.23 NEW TELEPHONE EQUIPMENT: NOT APPLICABLE**

**1.24 TESTS: NOT APPLICABLE**

**1.25 INSTRUCTIONS**

- A. Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
- B. Manuals: Maintenance and operating manuals (four copies each) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying

each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

- C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

**1.26 GOVERNMENT-FURNISHED PROPERTY: NOT APPLICABLE**

**1.27 RELOCATED ITEMS: (NOT APPLICABLE)**

**1.28 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT: NOT APPLICABLE**

**1.29 CONSTRUCTION SIGN**

- A. Provide a Construction Sign where directed by the COR. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts with

05-01-13

through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed.

B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.

C. Maintain sign and remove it when directed by the COR.

**1.30 SAFETY SIGN: NOT APPLICABLE**

**1.31 PHOTOGRAPHIC DOCUMENTATION**

A. Contractor shall provide weekly construction progress digital photos to VA. "Before and After" photos shall also be provided for items that are repaired or restored, including but not limited to lintel & sill repairs, door & window restoration, repair & restoration of gable end on the west elevation of 'A' wing, and new stair construction.

**1.32 FINAL ELEVATION DIGITAL IMAGES - NOT APPLICABLE**

**1.33 HISTORIC PRESERVATION**

Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the COR verbally, and then with a written follow up.

**1.34 TEMPORARY INTERIOR SIGNAGE**

When the contractor's work blocks doors and/or exists, changes paths, etc., the General Contractor is to provide all temporary signage to reroute personnel and block the doors or exits. Locations to be determined based on the ILSM.

- - - E N D - - -

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

**SECTION 01 01 10 - FSS**  
**FIRE SAFETY SECTION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:** This section covers safety precautions required by all contractor personnel to safeguard patients, visitors, and Department of Veterans Affairs employees.

**1.2 RELATED SECTION**

A. Section 01 00 00 - GENERAL REQUIREMENTS

**1.3 APPLICABLE PUBLICATIONS**









- A. NFPA standard No. 241 - Safeguarding Construction, Alteration, and Demolition Operations.
- B. NFPA Standard No. 51B - Fire Protection in use of cutting and welding Processes.
- C. NFPA Standard No. 101 - Life Safety Code (Current Edition)
- D. OSHA Regulations 29CFR1926 - Construction Industry Standards.
  - 1. Sub-part P- Fire Protection and Prevention
  - 2. Sub-part J- welding and Cutting

**PART 2 - PRODUCTS**

**2.1 PRODUCTS:**

A. Table F-1 indicates which fire extinguishers are required for various combustible materials.

**Table F-1 FIRE  
EXTINGUISHER  
S DATA**

TYPE OF AGENT					
 Each class of fire calls for the right kind of extinguisher. Using the wrong extinguisher is dangerous and may do more harm than good. For your own protection, you should know the classes of fire, the different types of extinguishers, how to use them and why.	Multi-Purpose Dry Chemical Monoammonium Phosphate	Regular Dry Chemical Sodium Phosphate	Halon 1211 Bromoclorodifluoromethane	Carbon Dioxide (CO <sub>2</sub> )	Water
 Fires in ordinary combustible materials - paper, wood, and many plastics. Quenching by water or insulating by Multi-Purpose (ABC), dry chemical is effective.	Yes-excellent Adheres to burning materials and forms a coating which will smother the fire and minimize reflash.	No	Yes-excellent Halon 1211 leaves no residue. May not normally affect equipment.	No	Yes Water saturates materials and prevents rekindling.
 Fires in flammable liquids such as gasoline, oils, grease, tars, paints, lacquers and flammable gases. Multi-Purpose (ABC), Regular Dry Chemical, Halon 1211, and Carbon Dioxide agents smother these fires.	Yes-excellent Dry chemical agent smothers fire. Screen of agent shields user from heat.	Yes-excellent Dry chemical agent smothers fire. Screen of agent shields user from heat.	Yes-excellent Halon 1211 leaves no residue. May not normally affect equipment.	Yes-excellent Carbon Dioxide leaves no residue, may not normally affect or damage equipment.	No Water will spread flammable liquids and not put it out.
Fires in electrical equipment.. Motors, generators, switches and appliances.. where a non conducting extinguishing agent Multi-Purpose (ABC), Regular Dry Chemical, Halon 1211 or Carbon Dioxide is required.	Yes-excellent Dry chemical agent is non-conductive. Screen of agent shields user from heat.	Yes-excellent Dry chemical agent is non-conductive. Screen of agent shields user from heat.	Yes-excellent Halon 1211 is a non-conductor, leaves no residue, may not normally affect or damage electrical equipment.	Yes-excellent Carbon Dioxide is a non-conductor, leaves no residue, may not normally affect or damage electrical equipment.	No Water, a conductor, should never be used on live electrical fires.
	5 to 20 feet 10 to 25 seconds	5 to 20 feet 10 to 25 seconds	8 to 18 feet 8 to 18 seconds Depending on size	3 to 8 feet 8 to 30 seconds	Up to 40 feet Up to 60 seconds
RANGE ----- Discharge Time -----					

## B. Cover Plates

1. Receptacles - Manufactured by H. B. Enterprises or equal. Catalog No. 007
2. Switches - Manufactured by N. 13. Enterprises. Catalog No. 003

**PART III - EXECUTION**

- 3.1 Construction offices and trailers used as storage are required to a located minimum distance from permanent structures. Veterans Administration approval of location does not relieve the contractor at this ultimate responsibility of meeting OSHA and NFPA Regulation.
- 3.2 Contractor is required to obtained a permit from the office of the Chief Engineer prior to start of each welding/cutting operation. The Chief Engineer reserves the right to delegate the Project Manager as approving official. The following form is acceptable for obtaining approval and may be reproduced at contractor's expense. Other form must be submitted for approval by the Project Engineer prior to use.
- 3.3 The following checklist is provided to the contractor as a quick reference only. NFPA 513 should be consulted for official requirements for protection of the area.

### REQUEST FOR SPRINKLER SYSTEM SHUTDOWN

Date Closed:	_____	Time Closed:	_____
Planned Date Restored:	_____	Time Restored:	_____
Location of System:	Bldg: _____	Floor: _____	Wing: _____
Area this will affect:	_____		
Impact on adjacencies:	_____		
Reason for shutdown:	_____		
If Construction, Give Project#:	_____	Generic Maintenance Contract	_____
Sprinkler Contractor:	_____	General Contractor:	_____
Phone:	_____	Phone:	_____
Remarks:	_____	Approval [ x ]	Disapproval [   ]
Approving Authority Comments: _____			

\_\_\_\_\_  
Signature/Approval Authority

**Copy one (1) VAMC, Form No 138-S1**

**Revised 2/05**

Location of System: Building: _____	Date Valve Reopened: _____
Wing: _____	Time Valve Reopened: _____
Floor: _____	Date Closed: _____
	Time Closed: _____
Print Name _____	Signature of Requestor _____
	Signature of FM Divisional Manager _____
REQUESTOR OF SHUTDOWN ID: O-001391 Copy two (2) VAMC, Form No 138-S2	Copy three (3) VAMC, Form No 138-S3 1,421

## PERMIT FOR CUTTING AND WELDING WITH PORTABLE GAS, ELECTRICAL, OR ARC EQUIPMENT

Date Disabled: \_\_\_\_\_ Time Disabled: \_\_\_\_\_  
Planned Date Restored: \_\_\_\_\_ Time Restored: \_\_\_\_\_  
Location of System: Bldg: \_\_\_\_\_ Floor: \_\_\_\_\_ Wing: \_\_\_\_\_  
Area this Will Affect: \_\_\_\_\_ Impact on Adjacencies: \_\_\_\_\_  
*The location where the work is to be done had been examined, necessary precautions taken, and permission is granted for this work.*  
Work to Be Accomplished: \_\_\_\_\_  
Construction Project#: \_\_\_\_\_ Generic Maintenance Contract \_\_\_\_\_  
Subcontractor: \_\_\_\_\_ General Contractor: \_\_\_\_\_  
Phone: \_\_\_\_\_ Phone: \_\_\_\_\_  
Approval [ ] Disapproval [ ]  
Signature/Approval Authority \_\_\_\_\_ Approving Authority Comments: \_\_\_\_\_

### ATTENTION

Before approving any cutting and welding permit, the Contractor's fire safety supervisor or his appointee and/or the PAI or his designee shall inspect the work area and confirm that precautions have been taken to prevent fire in accordance with NFPA 51B. Contractor is responsible to check off each item below that applies or indicate N/A.

### PRECAUTIONS

- \_\_\_\_\_ Sprinklers in service. Fully charged and operable fire extinguishers that are appropriate for the type of possible fire shall be available immediately at the work area.  
\_\_\_\_\_ The hot work equipment to be used shall be in satisfactory operating condition and in good repair.  
\_\_\_\_\_ The following shall apply to hot work done in close proximity to a sprinkler head:  
(a) A wet rag shall be laid over the sprinkler head and then removed at the conclusion of the welding or cutting operation.  
(b) During hot work, special precautions shall be taken to avoid accidental operation of automatic fire detection or suppression systems (e.g., special extinguishing systems or sprinklers).  
\_\_\_\_\_ Nearby personnel shall be suitably protected against dangers such as heat, sparks, and slag.

### WITHIN 35 FT. OF WORK

- \_\_\_\_\_ Floors swept clean of combustibles  
\_\_\_\_\_ If relocation is impractical, combustibles shall be protected with fire-retardant covers or otherwise shielded with metal or fire-retardant guards or curtains.  
\_\_\_\_\_ Combustible floors (except wood on concrete) shall be kept wet, covered with damp sand, or protected by noncombustible or fire-retardant shields.  
\_\_\_\_\_ Where floors have been wet down, personnel operating arc welding equipment or cutting equipment shall be protected from possible shock.  
\_\_\_\_\_ Openings or cracks in walls, floors, or ducts within 11 m (35 ft) of the site shall be tightly covered with fire-retardant or noncombustible material to prevent the passage of sparks to adjacent areas.  
\_\_\_\_\_ Covers suspended beneath work to collect sparks

### WORK ON WALLS OR CEILINGS

- \_\_\_\_\_ Construction noncombustible and without combustible covering  
\_\_\_\_\_ Combustibles moved away from opposite side of wall  
\_\_\_\_\_ If hot work is done near walls, partitions, ceilings, or roofs of combustible construction, fire-retardant shields or guards shall be provided to prevent ignition.  
\_\_\_\_\_ If hot work is done on one side of a wall, partition, ceiling, or roof, one of the following criteria shall be met:  
(a) Precautions shall be taken to prevent ignition of combustibles on the other side by relocating the combustibles.  
(b) If it is impractical to relocate combustibles, a fire watch shall be provided on the side opposite from where the work is being performed.

### WORK ON ENCLOSED EQUIPMENT

(Tanks, containers, ducts, dust collectors, etc.)

- \_\_\_\_\_ Containers purged of flammable vapors  
\_\_\_\_\_ Ducts and conveyor systems that might carry sparks to distant combustibles shall be shielded, or shut down, or both.

### FIRE WATCH

- \_\_\_\_\_ To be provided during and 30 minutes after operation  
\_\_\_\_\_ Supplied with extinguisher  
\_\_\_\_\_ Trained in use of equipment and in sounding fire alarm

### FINAL CHECK-UP

- \_\_\_\_\_ Work area and all adjacent areas to which sparks and heat might have spread (including floors above and below and on opposite sides of walls) were inspected 30 minutes after the work was completed and were found fire safe.

Signed: \_\_\_\_\_  
(Supervisor of Fire Watcher)

**SECTION 01 01 10 - SN  
SPECIAL NOTES**

**PART 1: GENERAL**

**1.1 NOT USED.**

**1.2 FIRE ALARM SYSTEM:**

**FIRE/SECURITY ALARM SYSTEMS:** Contractor shall advise the Graphic Control Center and/or the Police Desk at extension 41010/42222 respectively, prior to any work which might result in the Fire Alarm System or Security System (this includes but is no limited to: Smoke Detectors, Water Flow Switches, Pull Stations, Sprinkler Heads, Motion Detectors, Door Contacts, Security Door Controls, etc.) being activated, in addition to having an approved outage form from the Facility Management Department. Notification to Graphics and/or the Police Desk and having an outage form, does not absolve the contractor from following the proper procedures to prevent the system from activating, i.e. covering the smoke heads with paper bags, closing valves, containing dust, monitoring and controlling security devices, etc.). If any system activates due to the contractor's failure to notify the Graphic Control Center, the Contractor's failure to follow proper procedures, or the Contractor's failure to obtain an outage form, a Modification/Settlement by Determination deduction of \$2500.00 per alarm/event or notice from the Police that a construction area was left unsecured will be issued to the contractor.

**1.3 SCHEDULING OF WORK:**

- A. Contractor shall verbally schedule work areas with Resident Engineer not less than fifteen (15) calendar days in advance of commencement of work. Verbal notification shall be backed up and verified in writing.
- B. Contractor shall verbally schedule outages or service interruptions with Resident Engineer not less than fifteen (15) calendar days in advance of intended commencement of work. Notification does not guarantee the date of scheduled outage or service interruption however Resident Engineer will schedule such dates and inform the contractor. Date will be scheduled with medical center personnel when service interruption will minimize affect to hospital patients and operations. Contractor to submit VA System Outage Request form to Resident Engineer not less than fifteen (15) calendar days in advance of intended commencement of outage work. Contractor to attend (2) weekly pre-outage meetings with Engineering and staff to coordinate actual date of outage, duration, time of outage, phasing, and affected services. In addition, contractor to attend the pre-outage meeting one hour prior to outage to coordinate communications, readiness, pre-outage checklist, document requirements, temporary measures, lock out tag out and other outage requirements and procedures.
- C. Contractor to attend weekly construction meetings.

**1.4 PROTECTION OF WORK AREAS:**

Contractor to provide drop cloths when working in occupied areas to avoid staining or damaging existing carpets or vinyl tile floors.

#### **1.5 HOURS OF WORK:**

- A. The hours of contract work shall be from 7:00 a.m. until 4:30 p.m. the normal work shift for hospital employees, the contractor shall verify shift or shifts required for construction areas. Other than normal, after (off) hours, including federal holidays shall be scheduled two days prior to starting with the Project Manager. These off hours will be required to complete the project in the time allotted for the contract at no additional cost to the Department of Veterans Affairs. Upon approval of the Department of Veterans Affairs, the contractor will propose the scope or extent of off hour work due to individual contractor resources available to accomplish this project in the time allotted. In addition, these off hours will be required for utility/service interruptions, and any/other work that may interrupt the operation of the occupied space, i.e., some road construction, demolition, work in occupied areas, work affecting occupied areas, etc. Some noise producing demolition operations will be required to be scheduled for off work hours as directed by Resident Engineer and described on drawings.
- B. Certain work items, which require off-hour work, have been identified. These items are indicated on the drawings. Refer, in particular, to Phasing Notes on Drawings. All drawings shall be reviewed for off-hour work requirements and items creating disturbance to the hospital staff or patient care must be performed during off-hour working periods as established and approved by the VA Engineer.
- C. Building will be occupied during performance of work, but areas of alterations will be vacated. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel and patients through other construction areas, which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by the VA so that Medical Center operations will continue during the construction period. Contractor to construct 7 feet tall by 5 feet wide metal stud and drywall tunnels through occupied space as deemed necessary by the VA for access by Medical Center personnel and maintaining construction operations.

#### **1.6 SUBMITTAL APPROVAL AND START OF CONSTRUCTION PROJECT:**

No work may commence prior to the contractor receiving written approval of all submittals related to work on this contract. Delivery of submittals to the COTR or verbal acknowledgement of receipt by the Project Manager **does not** constitute approval.

#### **1.7 EMERGENCY SERVICE:**

All offerors, if successful, must be able to respond to all contract and contractor created emergency services resulting from contractor actions and

installations, as determined by the Department of Veterans Affairs Resident Engineer, with qualified staff personnel within one (1) hour of verbal notification during construction stages and warranty period. Bidders must be prepared to show proof, in writing, that they can satisfy this requirement prior to award.

#### 1.8 KEYS:

Keys for access to construction/work areas may be issued to the contractor at the discretion of the Project Manager. Up to three sets of keys will be provided at no cost. Additional keys will be provided for a charge of \$5.00 per key, payable by check to the Department of Veterans Affairs. All keys issued will be signed for and issued to the General Contractor. Upon completion of the work, failure to return all issued keys to the Project Manager will result in the issuance of a Settlement by Determination in the amount of \$100.00 for each outstanding key. In addition, a \$5.00 fee will be paid to VA for each outstanding key. Keys will be provided through the FM SAM Box. Keys are to be picked up and returned daily. If keys are not returned by the end of the day, a modification of \$5.00/key per day will be assessed against the contractor.

#### 1.9 SAFETY ITEMS:

- A. Training: All employees of contractor and subcontractor shall be aware of the egress routes from the construction areas. It is the contractor's responsibility to ensure all employees are aware of the fire alarm codes for the building they are working in and participate in fire alarm drills and actual fire alarms.
- B. Barricades: The contractor is responsible to erect barricades, construction and safety signs, and new egress routes. The barricades will be erected to restrict areas where hazardous operations are performed. The construction and safety signs shall consist of caution signs as determined and approved by VA; egress signs, where egress has been altered for construction; and any applicable hazardous warning signs. If the egress is changed due to construction, the contractor shall provide temporary directional signs for changes as determined by VA and for construction of any walkways, steps, or overhead protection scaffolding or the like as required providing a new means of egress. **Emergency egress plan shall be developed by the contractor and submitted for approval by the designated VA safety manager before egress routes are altered.**
- C. Fire Extinguisher: The contractor and subcontractor's shall provide fully charged and fully operational fire extinguishers as required and in accordance with section FSS on the job site(s) at all times. Reference section 01 01 10 FSS.
- D. Debris: Combustible storage and debris shall be kept to the lowest level necessary for required daily operations. The construction area shall be kept clean as indicated in general requirements and conditions
- E. Gasoline Powered Equipment: Gasoline powered equipment shall not be used within the confines of any building on the Medical Center without specific written permission from the Chief, Engineering Service.

- F. Fire/Smoke Doors: Fire and/or smoke doors shall not be propped open or prevented from closing and latching. This includes mechanical equipment rooms and utility closet doors.
- G. Construction Hard Hats: General Contractor to provide (4) sets of hard hats and safety glasses for each worksite for VA staff use.
- H. Exit Signs:
  - a. Inside Construction Space: Contractor to provide luminescent Exit Signs throughout the construction space such that while standing in any place within the construction space, an Exit sign is visible and the path of egress can be followed.
  - b. Outside Construction Space: Contractor will cover, relocate, etc. Exit signs impacted due to their construction operations as directed by the ILSM and the VA Safety Officer.

**1.10 SECURITY OF CONSTRUCTION SITES - Contractor Regulations**

- A. All construction sites must be secured to prevent inappropriate access by patients, visitors, and employees. While such security fences, doors, and barricades are temporary, they must be substantially installed to control access to the site. The existing security (Pegasys by Johnson Controls and Ingersoll Rand) system must be extended to each construction access door. Each construction door must be provided with an Ingersoll Rand Integrated Reader Lock programmed to the existing VA security system. Construction sites and all security measures must be monitored daily to ensure that security is maintained. Local VA Police must be alerted about the construction project. At the close of activity daily, before securing the site or portions of the site, the contractor must ensure that there are no patients, visitors, or staff in the area. If construction site problems arise, the Contracting Officer and COTR will take appropriate action to correct any and all safety and security conditions.
- B. VA engineering, safety/fire department, and police staff must have the right to access the construction site as needed to perform their assigned responsibilities.
- C. Lock up the worksite at all times to prevent patients and other unauthorized people from entering the site.
- D. The need for job site security is much greater when work is being conducted in psychiatric areas to protect the safety of the patients. All job boxes, tools, etc., must be locked up even when workers are on site unless there's enough activity to assure that patients cannot access tools or site. Verify that no one is in the construction area upon locking up the site for the evening.
- E. Two evacuation routes from the worksite must be maintained at all times.
- F. Contractors may lock up their tools etc., with personal locks.

**1.11 PENETRATIONS:**

A. WALL:

- a. All wall and/or floor penetrations created by work on this contract, whether by demolition or new construction, shall be patched by the general contractor or as assigned by the general contractor. All patching materials shall be of like kind or a suitable substitute approved by NFPA or UL.
- b. If the permit is for other than inspection, a Follow-Up Inspection page will need to be filled out by the person performing the installation/removal work, which then needs to be signed and returned to whoever originally issued the permit. The permit initiator is then responsible for checking the areas listed on the permit to ensure firestopping was completed according to Facility standards and penetrations sealed with an approved fire/smoke sealant compound so as to maintain fire and smoke separation integrity. Documentation of the sealant or system used in the penetration must be made available at the affected penetration by the permit requestor at the time of permit completion inspection. The program or person completing the follow up inspection must validate that the sealant compound or system is properly rated and installed for maintaining the rating of the affected smoke or firewall. Photo-documentation in lieu of interim inspections can be performed to validate work.
- c. ONLY (1) one type of fire sealant is permissible per hole.
- d. The permit will be in this person's possession while all inspections and/or work are being performed.

**1.12 WEATHER CONDITIONS:**

Cold and Extreme Heat Weather Construction. All construction shall have provisions for cold weather or extreme heat conditions regardless of solicitation date, construction award date, anticipated notice to proceed, and duration. Provisions are identified and defined but not limited to each specification section and drawings. Contractor to provide necessary means and methods required to accommodate cold weather or extreme heat construction conditions.

**1.13 SCAFFOLDING:**

Scaffolding must be free-standing and self-supporting. Securing of scaffolding to building shall not be permitted. Prior to setup of all scaffolding, the contractor is to provide a submittal of the scaffolding design through the submittal review process. The scaffolding design is to be stamped by a professional engineer. Contractor is to provide copies of daily scaffolding inspections with daily logs.

**1.14 ENERGY EFFICIENCY REQUIREMENTS:**

- A. Federal Executive Order #13423/#13514 requires all energy efficiency materials, equipment, and systems to be evaluated and if feasible incorporated into VA Projects. The A/E, prime contractor, and all subcontractors shall cooperate with the Federal Government in specifying, evaluating, documenting, purchasing, and installing energy efficient

equipment that meet basic energy efficiency criteria established by the VA. The criteria can be defined as comparing total energy savings to life cycle cost of the equipment, To accomplish this objective, the A/E shall produce an Energy Equipment Schedule comparing a description of each standard piece of equipment (system) versus a description of recommended efficient equipment (or system); including the estimated purchase price, estimated cost to install, maintain, and operate the equipment as well as the estimated annual energy usage and estimated useful life for each piece of equipment (or system).

- B. All design and installation will be in accordance with current VAMC, HVAC design guides, NEC, NFPA, ASHRAE 90.1, state, local and all VA and federal codes.
- C. The VA intends to provide energy savings equipment and design modifications for current energy usage to the most efficient and economical level possible.

#### **1.15 INSPECTIONS:**

- A. This building is part of a national historic landmark; all work shall be carried out in accordance with the secretary of the interior's standards for the treatment of historic properties, in particular the standards for preservation; test areas of the work, including but not limited to tuckpointing, masonry cleaning and paint removal shall be prepared by the contractor for inspection by the state historic preservation office (SHPO) or its agent; all work is subject to the approval of the SHPO.
- B. Contractor shall notify the VA COR a minimum of two days prior to the inspection date. Times and dates shall be scheduled and agreed upon by VA. Installations will be inspected by these VA personnel for work in compliance with State, Federal, Local, Dept. of Veterans Affairs Codes, regulations and contract specifications. If corrections, alterations, adjustments, new construction etc. is required, the VA will be notified within 48 hours of completion of such items. These inspections and corrections, alterations, etc. will be made at no additional time or cost to VA.

#### **1.16 CONTRACTOR'S AGREEMENT - RULES AND REGULATIONS FOR ALL CONTRACTORS**

The following is the contractor's agreement required to be signed at the pre-construction meeting and updated monthly when new subcontractors start working on the job site. The agreement will be preceded by a training video provided by the VA. The agreement is the general contractor's responsibility to ensure all subcontractor personnel are trained and acknowledge (sign) the agreement.

##### **A. STANDARD POLICY**

All outside General contractors and Sub-contractors will coordinate all work within the hospital with Facilities Management before beginning work.

##### **PURPOSE**

General Contractor will ensure that each individual General Contractor and Sub-Contractor employee is responsible for complying with established hospital standards, applicable OSHA Safety Requirements, federal, state and local environmental regulations, wearing prescribed safety equipment, and preventing avoidable accidents.

**C. PROCEDURE**

General Contractor will ensure that each individual general contractor and sub-contractor employee review, understand and acknowledge (sign) the following information prior to the commencement of work scheduled at this facility. General Contractor will forward copies of signed acknowledgements to Project Engineer of all new employees on a monthly basis.

**The following building rules and regulations affect all contractor personnel, suppliers, and vendors:**

**D. Access to Construction Areas**

- Access is limited to areas such as critical care and surgical units, as well as mechanical/electrical rooms, etc. Access can be obtained through Facilities Service.
- Access to any floors of the facility after normally scheduled work hours (Monday-Friday, 7:00 a.m.-5:00 p.m.) must be scheduled in advance with the Project section of Facilities Service. Police and Security reserves the right to refuse access to anyone without prior authorization and identification.
- Ready access for the Engineering, Safety, Police and (the Fire Department) shall be maintained to all areas under construction at all times.
- Areas under construction shall be locked during off-hours. Keys and cylinders for this purpose are obtained through Facilities Service. Contractors will not put their locks on any doors without VA approval.

**E. Accidents and Injuries**

- First Aid/Medical Aid/Emergency Treatment for workers: The contractor must post emergency phone numbers and treatment facilities if any contractor employees are injured on the job, or need medical treatment
- Work site injuries must be reported to the VA. The VA has an accident reporting form (form number 2162). The COTS/ Safety/ or Security and Police Service will initiate the 2162. Once the VA has completed the supervisor's portion the injured individual will be required to complete the narrative portion of the report. The service chief responsible for the contract is also required to sign the report and forward the original report to the Safety Section.

**F. Asbestos**

- There are both friable and non-friable asbestos-containing materials located within the hospital complex. Inspection reports are located in the Facilities Service Department. Contractors are required to be

aware of the asbestos materials located in the vicinity of their work. Further, all contractors are expressly forbidden to disturb any asbestos-containing materials unless specifically authorized in writing by VA. Under no circumstances are any materials supplied or installed by the contractor to contain asbestos in any form or quantity.

- Asbestos removal contractors will be trained and licensed, and will follow all OSHA rules, VA specifications, state and local regulations from notification to disposal.
- A VA representative will verify the adequacy of the barriers and ventilation before any asbestos removal work is conducted.
- The contractor is responsible for monitoring his own employees' exposure to asbestos.
- Additional specific asbestos removal specifications will apply.
- Contractor to provide a Fiscal Year breakdown of Asbestos Costs on the project.

#### **G. ACM TRACE WORK OPERATIONS**

The material descriptions in the pre-renovation asbestos inspection report include the phrase, "( $<1\%$  Asbestos by PLM Point Count)".

- **ACM TRACE RESULTS**• Should renovation activities deem the material friable due to cutting, grinding or other mechanical means of removal, an employer is bound by OSHA 29 CFR regulations 1926.1200 (d) {5} (iv) to protect their employees. This may determine that removal of the materials be performed by asbestos abatement workers trained in 29 CFR 1926.1101.

*\*OSHA regulation 1910.1200 HAZARDOUS COMMUNICATION Section (d) (5) Hazard determination "...employer shall determine the hazards of mixture of chemicals as follows: (iv) "If the...employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent... could be released in concentrations which would exceed an established OSHA permissible exposure limit...or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard."*

- **General Summary:**
  1. Employees, contractors, etc. must be warned about the presence of asbestos.
  2. The contractor must have a competent person on site during work. (At a minimum, it should be a trained, certified asbestos supervisor).
  3. Personal exposure assessments (negative exposure assessment) are required (PCM analysis) and workers should begin work with PPE.
  4. Wet methods and daily clean up and sealing waste in leak tight containers are required.
- The contractor will be responsible for proper work practices and prohibitions for all construction activities involving material that contains any amount of asbestos regardless of the exposure levels.

And the standard has exposure-based requirements, consisting of a 0.1 fiber/cc 8-hour TWA PEL and a 1 fiber/cc 30-minute excursion limit, and other requirements that apply whenever worker exposures exceed either or both of the limits, regardless of the amount of asbestos contained in the materials involved.

- If some of the building materials contain some asbestos but none of them contain >1 % asbestos, then removal of those materials is considered unclassified asbestos work. This means that only certain requirements of the standard's work practice and engineering control obligations and prohibitions apply. Some of the general requirements are not applicable because they apply to installed building materials containing >1 % asbestos (ACM). How many of the eligible general work practice and engineering control obligations, and prohibitions are applicable depends on whether the employee levels of exposure to airborne asbestos exceed either of the asbestos PELs. In further explanation: These OSHA references are specific to this issue.
- If the employees' asbestos exposures exceed neither asbestos PEL, then only two of standard's general work practice control procedures and three of the standard's general prohibitions apply to the sheetrock removal operation; none of the standard's engineering control methods apply to the sheetrock removal operation. Those general work practice procedures and general prohibitions the employer must observe under such a condition are those presented at:
- 29 CFR 1926.1101 (g)(1)(ii), which requires: **wet methods, or wetting agents, to control employee exposures during asbestos handling, ... removal, cutting, ... and cleanup, except where employers demonstrate that the use of wet methods is infeasible due to for example, the creation of electrical hazards ... [and] equipment malfunction...**; 29 CFR 1926.1101 (g)(1)(iii), which requires: **prompt clean-up and disposal of wastes and debris contaminated with asbestos in leak-tight containers...**; 29 CFR 1926.1101 (g)(3)(i), which prohibits: **high-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air**; 29 CFR 1926.1101 (g)(3)(ii), which prohibits: **compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air**; and 29 CFR 1926.1101(g)(3)(iv), which prohibits: **employee rotation as a means of reducing employee exposure to asbestos.**

#### G. Clean-Up

- All work activity within occupied portions of the facility shall be immediately cleaned and restored to its original finished condition upon completion of the activity. If the activity continues into the next workday, the area shall be left safe, clean, and presentable.
- Public restrooms are not to be used for the cleaning of tools or equipment, i.e., paintbrushes, rollers, finishing tools, etc. Janitor's slop sinks are available for this purpose. If janitor's closets are used, they must be cleaned.

- Trash, combustible waste, and excess construction materials must be removed daily to prevent accumulation. Contractors must arrange for the removal of their debris and waste.
- All work for an area must be confined within that space. Public corridors, stairwells, equipment rooms, and vacant floors are not to be used for the storage of materials or as a workshop. Tracking of construction dirt into the public corridors or stairwells must be prevented. The contractor will provide dampened walk-off mats at all entrances and exits from the construction area.
- If smoke detectors are covered during dust-producing activities, they must be uncovered daily.

**H. Compressed Gas Cylinders: NOT APPLICABLE**

**I. Confined Space**

- Confined Space Entries. All Confined Spaces are clearly marked on campus. NO ENTRY is allowed in the areas without prior approval by the Project Engineer. NO ONE will be allowed to enter these areas without the proper qualifications, equipment and training as required by the OSHA Standards (29 CFR 1910.147)
- Identify storm sewers, underground electrical vaults, and all other areas that require confined space permits. (e.g., a map showing the locations of all the confined spaces located in the Facilities Service Department).
- All hospital personnel that would require entry into these spaces must abide by the Confined Space Program Procedure.
- It is the sole responsibility of any outside contractor doing work on a VA Medical Center campus to coordinate entry into any of these spaces or any other marked permit required confined spaces with the medical center.
- Anyone entering a permit-required confined space must follow Occupational Safety and Health Administration (OSHA) Regulations, 29 CFR 1910.120.
- **Contractor to submit as a formal submittal the Confined Space Entry program (and CSE Permit if needed).**

**J. Contractor Room/Space Guidelines:**

- Materials will be kept on the job site, in the contractor's room or in storage space provided by the Contractor via trailer located in the VA corporation yard on the North East section of the VA grounds.
- Any shared space within storage room(s) must be accessible to Facilities Service. Do not block access to electric panels or fire protection equipment.
- Hallways are not to be used for storage.
- Contractors will manage the area and assure the site is kept clean and safe. (OSHA standards apply.)
- Any disputes or concerns will be directed to the Facilities Service Manager.

**K. Damage by Contractors**

- Any damage caused by the contractor's employees is to be reported to the COTR or Facilities Service Project Section immediately.

**L. Deliveries**

- All material deliveries at the loading dock must be coordinated with the Receiving Department in advance.

**M. Dress Code**

- All personnel must be appropriately dressed for their work. T-shirts or garments with obscene or suggestive messages are not permitted. Personnel found improperly dressed will be asked to leave the facility. No construction staff is allowed to remove shirts or other clothing. No articles may include offensive statements/graphics.

**N. Dust Barriers and Ventilation Requirements**

- Reference section 01 01 10 IC.
- Dust barriers are needed to protect occupied areas on any portion of the job that has potential to create dust.

**O. Elevator Usage**

- Contractors shall not hold or block from use any public elevators in any building unless authorized by the COTR.

**P. EMERGENCIES**

**Fire Plan - There is no difference between a fire drill and an actual fire.**

**General Contractor will ensure that each employee on the worksite knows where the pull stations are in the areas you are working.**

**If you are in the area of the fire:**

- R    Rescue anyone from the area if necessary**
- A    Pull the nearest Pull Station**
- C.    Contain the fire by closing all doors in the area**
- E    Extinguish if possible or Evacuate the area immediately**

**If you are NOT in the area of the fire:**

**Construction Workers are to cease activities, stay in place, and wait for further instructions or cancellation of the fire drill.**

**DO NOT move through the hospital. DO NOT use the elevators or stairwells.**

- Medical Emergencies - Any contractor who witnesses a medical emergency is to pick up a nearest phone and dial "911" or the operator and describe the condition of the emergency.
- Accidents/Injuries - The contractor must post emergency phone numbers and treatment facilities for any injured employee.

- Worksite injuries must be reported to the VA immediately using the VA accident reporting form (Number 2162). The COTR/Safety/or Security and Police Service will initiate the 2162.
- Patients and visitors may be anxious or irritated because of their situation. If you are faced with any patient or visitor that gets aggressive with you, simply call Ext. 42222 and say "Code Green" and describe the situation. Security will respond immediately.

**Q. Equipment Safety**

- Ladders are not to be left unattended in public areas during breaks and lunch hours. Ladders shall be laid down and placed out of traffic areas during these periods.
- No tools, carts, ladders or other equipment are to be left unattended outside a secure area.
- Yellow safety barricades must be used when working in public areas.
- Use of hospital equipment is permitted only if the contractor receives permission from Facilities Service and is properly trained on the USC of the equipment.

**R. Equipment and Supplies**

- Caution must be used with all flammable materials, i.e., adhesives, thinners, varnishes, etc.
- All paints shall be low odor latex paint. The contractor will use odor reducing agents in all paints and solvents. Ventilation will be required if toxic or foul-smelling materials have to be applied.
- Only a one-day supply of paints, oils, and gas cylinders is permitted within the facility, unless it's properly stored in a flammable liquid storage cabinet.

**S. Fire Alarm System**

- Care must be exercised to prevent the accidental tripping of smoke detectors or fire alarms.
- Notify Facilities Service of your activities and location.
- Cover and protect the smoke alarms with paper bags when raising dust or creating smoke in short duration (less than 3 days) ancillary work areas. All other construction areas to follow section 01 01 10 - 1HR. (You must inform Facilities Service Fire Department when bagging smoke alarms.)
- Remove the paper bag upon completion of your work and at the end of each workday.
- If you accidentally trip an alarm, notify Facilities Service (Fire Department) immediately.

**T. Hazardous Materials and Waste**

- A listing of all hazardous materials that will be used on the job and their material safety data sheets (MSDS) will be provided to the VA before the chemicals are used.
- Any excess or used chemicals will be removed from the hospital promptly and properly disposed of by the contractor in accordance with federal, state and local regulations.

- Any hazardous waste generated at the facility must be properly contained and labeled and stored in accordance with local, state, federal and hospital regulations.
- Do not store flammable materials in the facility unless stored in an approved non-combustible storage cabinet or prior approval by the Project Engineer and Safety Office.

**U. Heavy Lifting**

- Hoisting heavy materials/items require prior review by the Project Engineer.

**V. Housekeeping**

- Housekeeping in public areas of the hospital will be maintained at the highest level, even while work is on going.
- In secured areas, housekeeping will be performed as needed, but at a minimum at the end of each job task, and at the end of the workday.
- Debris and waste will not be allowed to accumulate on the work site and disposal must be arranged to keep the amounts low.

**W. Hot Work Permits**

- Hot work permits are required before cutting, soldering, welding operations begin. Before any cutting, soldering or welding is conducted, the contractor or sub-contractor shall obtain permission through a hot work permit. The contractor shall be responsible for obtaining the hot work permits from the Project Engineer.
- Gas and oxygen canisters shall be properly chained and protected and two 10-pound fire extinguishers shall be present.
- A fire watch shall be maintained on the worksite during the hot work operations, and for 30 minutes after the hot work is completed.
- **All burn permits will be completed, signed and scanned within 48 hrs and posted to Buzzsaw.**

**X. Identification Badges**

- ID Badges are required for all contractor employees working at the V.A.
- Before beginning work on any project, all outside contractors shall check obtain a VA contractor badge from the Police / Security Desk and obtain a contractors I.D. badge. The Contractor will complete the badge application and email it to the COTR, who will forward to the Police. The contractor will stop at the Police Desk 1-2 days later to complete the badge process. VA contractor badges are required for all contractors and consultants who will be onsite for more than (3) total days of the project. Temporary badges will be provided to the GC for contractors onsite for less than (3) days. The outside contractor will supply the following information: location of work site, authorization, duration, and any pertinent information that is required.

**Y. Infection Control: NOT APPLICABLE**

**Z. Interim Life Safety**

- The hospital will document whether and to what extent Interim Life Safety Measures will be implemented for each project.

- VA Safety will ensure what interim life safety measures (ILSM) are required by the General Contractor to temporarily compensate for the hazards posted by existing Life Safety Code (LSC) deficiencies or construction activities in areas of the Medical Center.
- Implementation of ILSM will be required in or adjacent to all construction areas and throughout buildings with existing LSC deficiencies, ILSM applies to both construction workers and affected hospital employees, and will be implemented upon construction development and continuously enforced through construction completion.
- Almost always, Interim Life Safety Measures will require walkthrough inspections by the job foreman, the project manager, and safety staff at varying intervals.
- Training of workers and any affected staff will always be a significant part of the
- Interim Life Safety Measures procedures.

**AA. Life Safety**

- Any life safety code violations incurred during construction or renovation must be resolved and will result in close coordination with Project Engineer and Safety Section to implement the hospital's Interim Life Safety Measures. These measures are required by JCAHO and NFPA.

**BB. Lock Out/Tag Out**

- Lock Out/Tag Out - No contract worker is allowed to change the status/position of ANY switch, valve or any other energy source without prior approval from the Project Engineer. All Lock out/Tag Out activities need approval prior to being implemented. Any activity requiring a Lockout/Tagout process must comply with the hospital policy.
- Per OSHA Regulation 29 CFR 1910.147, all contractors must comply with OSHA's Safety Lockout/Tagout procedures.
- Coordinate all shut downs with Hospital Personnel.
- Only VA staff is authorized to shut down utilities unless permission is specifically granted.
- **Contractor to submit as a formal submittal the Lock Out / Tag Out Program policies and procedures.**

**CC. Material Safety Data Sheets (MSDS)**

- MSDS must be provided for any hazardous materials that you will be shipping or delivering to the VA Medical Center.
- MSDS are available for all materials used in the medical center. Contact the COTR if you need an MSDS for a VA owned material.
- See also Hazardous Materials and Wastes.

**DD. Noise**

- All core drilling, chipping, and hole drilling shall be done at a time and day determined by occupants on that floor and the floors above and below. The COR shall coordinate and approve it.
- The patients, visitors, and staff deserve consideration and the quiet enjoyment of their premises. Anyone found being loud, rude, or

otherwise annoying to the patients, their guests, or staff will be asked to leave the facility. Use of vulgar language will not be tolerated.

- All work activity within occupied portions of the facility shall be accomplished with minimal disruption to the patients, physicians, visitors, and staff.
- The playing of radios, tapes, and CD players is not permitted in any occupied area. "Walk-man" radios/tapes/CD players are not permitted anywhere.
- The playing of radios, tapes, and CD players is permitted in vacant areas but shall not be heard outside the vacant area.
- In inpatient areas, coordinate construction activities and debris removal with the Nurse Manager or Charge Nurse to minimize disruption.

**EE. OSHA Compliance**

- All contractors are subject to Occupational Safety and Health Administration (OSHA) regulations, these standards and are expected to enforce these standards in the performance of their work, OSHA regulations can be found in chapter 29 of the Code of Federal Regulations (CFR). Failure on the part of any contractor employee to comply with these standards and/or conduct their work in a safe fashion will result in an interruption in the work schedule for which the contractor will be solely responsible, Any contractor found deviating from regulatory standards and/or policy and SOPS will immediately be issued a stop work order and will be responsible for contractual conflicts related to the work stoppage.

**FF. Parking**

- Facilities Service Project Section will designate parking. Contractors may not block fire lanes or other roadways. Violators will be ticketed. During large construction projects, a staging site may be available for parking to contractors.
- All Contractors who need parking must contact Facilities Service for a parking permit.
- If special parking is required, permission shall be granted and coordinated through Facilities Management. Contractors should park in the designated Visitor parking areas. Limited loading and unloading will be permitted at the loading dock area, afterwards contractor employees will be required to park in designated areas.

**II. Patient/Visitor Privacy**

- Patient/Visitor Privacy. No construction staff is allowed to review, acknowledge or move any patient information or records.
- No construction staff may acknowledge any patient or visitor unless spoken to - even if the individual is known on a personal basis.
- Radios are NOT allowed on campus.
- Cell phones are to be used only in designated areas.

**JJ. Personal Protective Equipment**

- There are many situations that require specific personal protective equipment for worker safety according to OSHA. It is the

responsibility of the individual contractor to know when it is to be used and is responsible to wear them.

**KK. Restroom Usage**

- Contractors are to use public restroom unless otherwise instructed to specific restrooms or portable facilities.

**LL. Requests for Information**

- All contractor requests for assistance and information shall be addressed to the Facilities Service Project Section or Facilities Service Department.

**MM. Safety Regulations**

- Contractors are expected to comply with all Occupational Safety and Health Administration (OSHA) regulations, 29 CFR 1926 and 1910.
- Work that is performed within a corridor or occupied space must be confined by dust barriers or non-combustible partitions.
- Appropriate job signs and barricades are to be placed in the area of construction to prevent occupants from straying into the job site.
- Stairwell doors shall not be propped open or blocked at any time. Equipment cannot be stored in the stairwells.
- All contractors are encouraged to frequently review these guidelines with their employees and/or subcontractors on site (e.g., during weekly Tool Box Safety Meetings).
- All contractors and their subcontractors are responsible for complying with these guidelines and all other conditions, OSHA requirements, and safety regulations.

**NN. Scaffolding**

- Scaffolding must be free-standing and self-supporting. Securing of scaffolding to building shall not be permitted.
- Prior to setup of all scaffolding, the contractor is to provide a submittal of the scaffolding design through the submittal review process. The scaffolding design is to be stamped by a professional engineer.
- Contractor to provide copies of daily scaffolding inspections with daily logs.

**OO. Smoking**

- The Smoking policy of the hospital is no smoking in any building nor within 50 feet of any the building entrance and only in areas designated for smoking. All construction employees must comply with this policy. A copy of the hospital smoking policy will be supplied at the pre-construction conference.
- Violation of the smoking policy will result in the worker being removed from the worksite for the duration of the project.
- The designated smoking areas are: Smoking Shelter located outside the East entrance
- Job site supervisors will enforce this smoking policy.

**PP. Stop Work**

- The hospital safety officer and COR have the Director's permission and authority to stop work whenever conditions pose an imminent threat to life and health or threaten damage to equipment or buildings.

**QQ. Subcontractors**

- The general contractor has the responsibility to assure that all the subcontractors and their workers are properly trained and follow these safety guidelines. Assistance from VA staff will be providing on a case by case basis on technical issues.
- The VA reserves the right to approve of any subcontractor being used to complete a project.
- A worker on-site must be designated "in charge" at all times during the project.

**RR. Traffic Control**

- Contractors shall provide trained personnel and/or equipment, signage, barricades etc., to regulate traffic whenever construction operations affect traffic patterns.

**SS. Trenching**

- OSHA regulations must be followed during trenching operations.

**TT. Waste Management**

- Reference section 01 74 19.
- Trash, combustible waste, and excess construction materials must be removed daily to prevent accumulation. Contractors must arrange for the removal of their debris and waste. The building's dumpster shall not be used unless appropriate arrangements are made with Facilities Service.
- The contractor is encouraged to contact utilize our recycling program for the disposal of recyclables.
- The contractor is expected to comply with all environmental regulations.
- Contractor to provide a Fiscal Year breakdown of Waste Management/Recycling Costs on the project.

**UU. Work Site Requirements**

- All contractors are to maintain their work area as clean as possible while working and cleanup thoroughly every day.
- Prior to any utilities or critical systems being interrupted, a two weeks written notification to Facilities Management Project Engineer is mandatory. Only Facilities Management personnel will shut off a utility.
- All contractors are expected to use courtesy. Loud, vulgar, abusive language, sexual harrassment and aggressive behavior will not be tolerated.
- All contractors working above the ceiling are required to replace all disturbed ceiling tile by the end of each day.
- Prior to making any penetrations in walls, floors or ceilings, it is the contractor's responsibility to identify rated systems and be verified through review of as builts, line diagrams, etc.

- All repaired penetrations on rated systems must be completed using a fire rated material matching the rating of the system and must be inspected by the Project Engineer before ceiling tiles are replaced or area is concealed.
- Temporary construction partitions of non-combustible materials shall be installed as required to provide a smoke tight separation between the areas undergoing renovation and/or construction and adjoining areas that are occupied by the facility.
- Exits for occupied areas of the building including rooms, suites, corridors and floors shall not be blocked by the construction or by construction materials. Exit may be blocked temporarily if it is unavoidable and adequate alternative measures are provided, such as signage, instructions to occupants and approved in advance by the Project Engineer.
- Existing fire protection systems including fire alarm systems, smoke detection systems, and sprinkler systems shall not be altered except as required for the alteration and/or renovation project. Any alteration to the system shall be coordinated with Project Engineer. When sprinkler or fire and smoke detector systems are out of service for more than eight hours general contractor shall be responsible to institute a Fire Watch till systems are operational.
- At the end of each workday, combustible packaging and crating materials for building products and equipment to be installed shall be removed from the occupied building.
- It is the responsibility of each contractor to know exactly where the fire extinguishers and pull stations are in the areas they are working.
- Fire hazard inspections shall be conducted daily by the contractor once construction starts and until the work is turned back over to the facility.
- All temporary electrical wiring and equipment used for construction shall be installed and used in accordance with pertinent provisions of NFPA 70 and National Electrical Code.
- Contractor shall maintain construction site to permit access by the fire department as necessary. Clear building construction areas of obstructions so that all portions are accessible for fire department apparatus and permit emergency egress of patients and other personnel.
- All necessary precautions shall be taken by the contractor to prevent accidental operation of any existing smoke detectors by minimizing the amount of dust generated in the vicinity of any smoke detectors. Any activity that may generate dust or smoke shall be reviewed with the Project Engineer and the infectious control nurse.
- Contractor to provide a list of emergency contacts at the entrance to construction site.

#### **1.17 STANDARD REQUIRED FORMS**

A. The following forms are required as noted below:

- a. Contractor's Checklist - Completed and signed by General Contractor

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

- b. Contractor's Impact Statement - Completed and signed by every contractor / subcontractor working on the project.
- c. Daily Log of Construction - Completed daily by General Contractor.
- d. Daily Intermediate Life Safety Measures (ILSM) Inspection Form - Completed daily by General Contractor.

### CONTRACTOR CHECKLIST

This agreement is between \_\_\_\_\_ and \_\_\_\_\_  
Project Name (ref. #) \_\_\_\_\_  
Project Start Date \_\_\_\_\_ Ending Date \_\_\_\_\_  
Work Allowed Between Hours \_\_\_\_\_ AM/PM and \_\_\_\_\_ AM/PM

**Before performing any work on facility premises, outside contractors must read this checklist and comply with all local, state, federal and facility safety policies.**

**1.0 Life Safety** Will the contractor compromise any part during the Life Safety System of this facility (ceiling tiles, penetrations in smoke or fire walls, blocking exits, shutting down fire/smoke detection or fire suppression, etc.) **Y N**  
Describe. \_\_\_\_\_  
\_\_\_\_\_

**1.1** Is Interim Life Safe necessary? **Y N**, if yes, attach and follow interim plan.

**2.0 Services** Will there be any compromises to patient services during the work performed? **Y N**

**2.1** What adjustments need to be implemented to minimize impact to residents, visitors and staff? **Y N** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3.0 Chemical** Will hazardous chemicals (liquids or gases) be used on-site? **Y N**  
If yes, what risks do they create for facility staff? Is there any chance of exposure? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3.1** Are there any facility chemicals being used, stored or handled where the contractor will be working? **Y N**

If yes, has the contractor been informed by issuing MSDS's? **Y N**

**4.0 "Hot Work":** Will the contractor use equipment which will generate open flames, sparks or other ignition sources **Y N**

**4.1** Will flammable chemicals be in the area? **Y N**

**4.2** Will a **Fire Watch** be necessary to be posted during all Hot Work activities? **Y N**

**5.0 Confined Spaces:** Does the work involve entry into a confined space? **Y N**  
If yes, retain a copy of contractor's Confined Space Entry program (and CSE Permit if needed).

**6.0 Lockout/Tagout :** Does the work involve maintenance on energized equipment or systems? **Y N** (If yes, retain a copy of the contractor's LOCKOUT/TAGOUT program)

**6.1** Is there any impact to residents, visitors, or staff during this procedure? **Y N**  
If so, describe the impact, ways to minimize the impact and who has been notified. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**7.0 Unsafe Conditions/ Impact to Residents, Visitors and Staff** Are there any unusual or unsafe conditions which need to be addressed and/or communicated to facility staff, visitors or residents? ? Y N

Describe. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8.0 Description of Work Area** The departments/areas you will be working are

List: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8.1 The potential hazards to you/your workers in the areas you are working in**

List \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**8.2 The specific problems that can be caused by the wrong actions in the areas you are working**

List \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**9.0 Contractor's Employees**

**Safety Officer Contact** \_\_\_\_\_

**Facility Project Manager** \_\_\_\_\_

**First Aid Plan** \_\_\_\_\_

**Fire Plan** \_\_\_\_\_

**Disaster Plan** \_\_\_\_\_

**Restricted Areas** \_\_\_\_\_

**10.0 Restricted Areas**

The following are the areas of the hospital where construction workers are allowed to go in the hospital.

List \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Contractor Representative)

Date: \_\_\_\_\_

\_\_\_\_\_  
(Facility Project Manager)

Date: \_\_\_\_\_

**Contractor's Impact**

<b>System</b>	<b>Possible Interruption</b>	<b>Possible Effect to Patients</b>
<b>Electrical</b>	<ul style="list-style-type: none"> <li>- Changing position of switches and breakers</li> <li>- Cutting or splicing into wires</li> <li>- Disconnecting wires or terminals</li> <li>- Disturbing Junction Boxes/Electrical Panels</li> <li>- Core Drilling</li> <li>- Demolition of walls</li> <li>- Excavation</li> </ul>	<b>Electrical Systems provides LIFE SUPPORT (Directly and Indirectly)</b> <ul style="list-style-type: none"> <li>- Can cause DEATH to critical patients</li> </ul>
<b>Water Lines</b>	<ul style="list-style-type: none"> <li>- Turning valves</li> <li>- Cutting into lines</li> <li>- Demolition &amp; Excavation</li> </ul>	<b>Dialysis, OR, HVAC, ICU, X Ray, etc</b> <b>Can cause DEATH to critical patients</b> <b>Infection Control issues</b> <b>Major Cleanup issues</b>
<b>Medical Gases:</b> <b>Oxygen</b> <b>Air</b> <b>Vacuum</b> <b>Nitrous Oxide</b> <b>Nitrogen</b>	<ul style="list-style-type: none"> <li>- Cutting or disturbing into lines (labeled, unlabeled)</li> <li>- Changing valve positions</li> <li>- Deactivating alarms</li> <li>- Demolition &amp; Excavation</li> </ul>	<b>Oxygen, vacuum, air, etc.</b> <b>ICU, OR, Med/Surg.</b> <b>Can cause DEATH to critical patients</b>
<b>HVAC</b>	<ul style="list-style-type: none"> <li>- Shutting down</li> <li>- Modifying</li> <li>- Changing controls</li> <li>- Cutting into the roof</li> <li>- Producing foul odors near intakes</li> <li>- Cutting into chilled water lines</li> <li>- Obstruct fresh air intake</li> </ul>	<b>Temperature is critical in OR, ICU, etc.</b> <b>Infection Control issues</b> <b>Major Air Quality Issues</b>
<b>Fire Alarm and Sprinklers</b>	<ul style="list-style-type: none"> <li>- ANY modifications</li> <li>- covering or removing smoke heads</li> <li>- Demolition &amp; Excavation</li> <li>- Damage or set off sprinkler heads</li> <li>- Duct work modifications</li> </ul>	<ul style="list-style-type: none"> <li>- Compromising Fire Safety</li> <li>- False Alarms</li> <li>- Floods</li> <li>- Major disruptions and distractions</li> </ul> <b>ALL THE ABOVE CAN RESULT IN DEATH</b>
<b>Code Alarms</b> <b>Nurse Call</b> <b>Wander Guards</b>	<ul style="list-style-type: none"> <li>- Demolition &amp; Excavation</li> <li>- Unplugging</li> <li>- Changing position of switches/breakers</li> </ul>	<b>Lack of communicating system can result in patient death or injury</b>

**IF THERE IS ANY QUESTION REGARDING ANY OF THE INFORMATION ON THIS DOCUMENT, IMMEDIATELY CONTACT FACILITY MANAGEMENT OR SAFETY OFFICE TO RESOLVE ISSUES PRIOR TO WORK COMMENCEMENT.**

Contract Company: \_\_\_\_\_

Receipt Acknowledged: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## DAILY LOG OF CONSTRUCTION

M T W Th F Pkg. N

PROJECT:

BUILDING

CONTRACT NO.  
V69DC-

DATE

CONTRACTOR

CONTRACTOR REPRESENTATIVE ON JOB

WEATHER (*Rain, Snow, Cloudy, Windy, etc., OR  
NA if all indoors*)

TEMP.

High | Low

SITE CONDITIONS (*CLEAN, DEBRIS, DUST,  
ETC.*)

NO. CONTRACTOR'S MEN BY JOB CATEGORIES

NO. SUBCONTRACTOR'S MEN BY JOB  
CATEGORIES

EQUIPMENT ON JOB

No.

Working

MATERIALS DELIVERED

*Brief description of size*

Units

Yes

No

OFFICIAL VISITORS TO JOB SITE

### STATUS OF WORK

ITE Brief description of work in progress, questionable performance, unforeseen developments on job etc. Include tests made  
M and samples taken.  
NO.

STATUS OF INFECTIOUS CONTROL MEASURES (NEGATIVE AIR FLOW, CLEAN WALK OFF MAT,  
ANTE-ROOM SECURE,...)

NEGATIVE AIR FLOW PRESSURE READING: \_\_\_\_\_

SAFETY COMMENTS

DIFFICULTIES WITH CONTRACTOR OR REPRESENTATIVE

UNFORESEEN DEVELOPMENTS ON JOB CONTINUED (*Describe conditions, action taken; person  
contacted, recommended actions*)

SIGNATURE

TITLE

PROJECT SUPERINTENDENT

FORM QCA-01A

### Daily Intermediate Life Safety Measures (ILSM) Inspection Form

**INSTRUCTIONS:** This form is to be utilized when significant hazards posed by existing NFPA 101 deficiencies or construction activities are in progress. ILSM must be implemented upon project start and continuously enforced through project completion to provide a level of life safety comparable to that described in Chapter 1-7, 31 and applicable occupancy chapters of the Life Safety Code. WHERE APPLICABLE NOTE EXCEPTIONS ONLY OF AREA IDENTIFIED AS BEING DEFICIENT DURING INSPECTION AND EXPLAIN IN SUFFICIENT DETAIL IN THE COMMENTS SECTION OF THIS FORM. TURN COMPLETED FORMS INTO THE LHS SAFETY OFFICER.

PROJECT:	DATE	MON	TUE	WED	THR	FRI	SAT	SUN
1. Are exits readily accessible and provide unobstructed egress?								
2. If required, due to inaccessibility of existing, have alternate exits been established?								
3. If alternate exists have been established, are personnel in the area informed and aware of their relocation and existence?								
4. Are the existing and relocation exits clearly identified and able to be seen in the event of an emergency or fire?								
5. Are fire evacuation routes posted and do they reflect up-to-date changes and alternate escape routes due to construction deficiencies?								
6. Are written procedures and guidelines posted in the immediate and adjacent areas for what to do and who to call in the event of fire or emergency?								
7. Are personnel in the immediate and adjacent areas aware and informed as to the procedures and guidelines to follow in the event of fire or emergency?								
8. Do fire alarms, detection, and suppression equipment and systems appear to be operational?								
9. If the fire alarm or suppression systems are impaired or temporarily made nonfunctional has a fire watch, as required or necessary, of the area been established?								
10. If the existing fire alarm or suppression systems/equipment are impaired, have measures been taken to provide equivalent equipment/systems for adequate protection? Note date of installation for equivalent measures to the right.								
11. If the fire alarm or suppression systems are impaired, are the temporary equipment/systems being inspected and tested at least monthly?								
12. If temporary fire alarm or suppression systems are installed, are personnel in the area aware and informed on how to operate or utilize in the event of fire or emergency?								
13. Has the LHS "No Smoking" policy been posted, implemented and enforced in the construction area?								
14. Are construction/remodel area storage, waste and debris being maintained to minimize potential for fire or safety hazards during daily operations?								

**Daily Intermediate Life Safety Measures (ILSM) Inspection Form (Continued)**

PROJECT:	DATE	MON	TUE	WED	THR	FRI	SAT	SUN
15. Are temporary partitions built to be smoke tight and of noncombustible/fire retardant materials to minimize spread of smoke or fire within the building?								
16. Do electrical panels, temporary wiring, extension cords, tools and equipment appear to be installed, utilized, and functioning in a safe manner?								
17. In general, are the exterior construction site, buildings, and ground free of hazard and potential safety violations?								
18. If there is any gas/arc welding or cutting being performed within the building or on site, have additional fire safety precautions been taken and the necessary equipment provided and utilized?								
19. If there is any gas/arc welding or cutting being performed within the building or on site, has the Plant Operations department been notified?								
20. If there are hand and safety rails required, are they in place and maintained in good condition?								
21. Are extension cords that are being used a 3 wire grounded type?								
22. If there are temporary electrical outlets provided, do they have ground fault protection at the receptacle or at the panel?								
23. If hazardous chemicals are present and/or being used, are they being limited to the amount needed and used daily?								
24. Are MSDS sheets readily available for any hazardous chemicals that are present or being used?								
25. Do ladders and scaffolds appear to be in satisfactory condition and being utilized in a safe manner?								
26. Is personnel protective equipment, such as safety glasses, hard hats and etc. needed or required and being used?								
27. If infection control is required, are the appropriate policies and procedures known and being followed?								
28. If electrical equipment needs to be de-energized, are applicable "Lockout/Tagout" procedures being followed?								
PLACE INITIALS OF PERSON PERFORMING DAILY INSPECTION TO THE RIGHT.								

INSPECTION COMMENTS/FINDINGS: \_\_\_\_\_

DATE PROJECT STARTED \_\_\_\_\_ DATE PROJECT COMPLETED \_\_\_\_\_

PROJECT CE #: \_\_\_\_\_ GENERAL CONTRACTOR \_\_\_\_\_

AREAS(S) OF PROJECT/JOB INSPECTED \_\_\_\_\_

1.18 Project Specific Risk Baseline (Appendix A)

Risk Baseline					
Project: BUILDING 6 FCA DEFICIENCIES				Date	October 24, 2013
Completed By:					
Complete risk analysis as part of the scope of Design Services and to be updated throughout design of project at design programming, schematics, 35% CD's and 95% CD's and precon.					
	Project Risk	Impact (List issue(s) to be addressed)	Probability /Impact H, M, or L	Measures taken to Resolve or Mitigate	Measures in Design/SOW
1	What utilities are involved and what will utilities affect?				
a	Medical Gas				
b	Water				
c	HTHW				
d	Steam				
e	Power Indicate if CR, LS, Q, or Normal				
f	Fire Alarm				
g	Data/Telephone				
h	HVAC				
i	Wireless				
j	Sprinkler System				
k	Pneumatic Tube	Pneumatic Tube to be powered from Panel EPH-Q-BO4-1			
2	What type of other outages are anticipated?				

3	What are adjacencies to construction?				
4	Is the project close enough or operations disruptive enough to affect critical/sensitive areas of operation in the hospital, (ICU, Cath Lab, OR, Pain Clinic, ER, Imaging, Dialysis, Audiology, Oncology, Lab, etc)				
5	Where will ancillary work be located?				
6	Will/How ancillary work affect patient Care?				
7	Are there moves to patients or staff involved?				
a	Will they affect start of project?				
b	If patient services are affected how will this be handled?				
c	Will staff correspondence need to be changed due to relocations or renovations?				
8	Patient Safety issues? Addressed?				
9	What are the hours of work for main project area?				
10	What are the hours of work for the ancillary areas?				
11	Is way finder signage required? Is replacement of exiting signs required? New rooms signs?				
12	What is the FCP for the project and FY.				
13	Where do you get funds for changes?				
14	Has the time table been verified by the contrator (CPM)?				

15	Weather, need to verify seasonal schedule and working conditions.				
16	Energy, Focus on Energy: Part of the design; equipment and materials – timeliness and impacts to schedule.				
17	Is it likely there will be physical disruption of the water system/lines or stagnation of the water system for greater than 7 days?	Yes___ No ____		<p>If yes, please employ the following interventions):</p> <ol style="list-style-type: none"> <li>1. All hot and cold water systems will be flushed until flowing clear and without air in the system (not less than 10 minutes)</li> <li>2. All faucets and shower heads will be removed and cleaned</li> <li>3. Temperatures will be taken to insure hot water is within limits</li> <li>4. Water samples will be taken to verify levels of chlorine and ensure safe water for human use</li> <li>5. Take a representative sample at affected distal fixtures and send for culture testing</li> </ol>	
18	What is the facilities Tuberculosis Risk Assessment classification?	____ Low ____ Medium ____ High			

19	TB Risk - will the construction worker be in an area where risk of exposure to suspect or confirmed TB (Negative Pressure Room: HEPA filtered) or exposed to exhaust ventilation system from exposure area?			<p>If yes, then, follow TB Screening as addressed in Contract Guidelines for Tuberculosis (TB) requirements outlined in VHA Directive 2011-036, Safety and Health During Construction dated September 22, 2011 for all VISN 12 facilities).</p> <p>The contractor must provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors will be required to show documentation of negative TB screening reactions for any additional workers who are added after the 90-day requirement before they will be allowed to work on the work site.</p>	
20	Staging				
a	Large pieces of equipment and sections of AHU both new and demo, where will they be staged?				
b	Job trailer required?				
21	Security				
a	Jobsite security - electronic badge, key				
b	Special contractor access required - separate key in SAMS box, badges,				
c	Off hours access				

d	Key Plan and Cores and Divisions	Number of cores: _____ Series: _____			
22	Fire Safety Review	Required - _____		Date to Reviewer - _____ Comments Received - _____ Comments Incorporated - _____	
23	ISO Appendix A	Required - YES		Project Manager to fill out and submit to Contracting	
24	Will there be demolition/construction waste? (all waste must be diverted from landfill and recycled whenever possible)				
a	Does the project involve or generate any of the following: - Air Emissions including GHGs - ACM - Utility Modification - Soil Disturbance - Water Treatment - Petroleum Storage - Hazardous Waste - Radioactive Waste - Mixed Waste - RCRA or CERCLA - Wetlands - Permits - Aesthetics - Disturbance of Historic District - Biological Resources	Environmental Review of Federal Action:			
25	Will there be space needed for waste collection/recycling segregation?				
26	System Commissioning	System Checkout Mfg Startup Test Operation Diagnostics System Certification			

27	Building Integration	<ul style="list-style-type: none"> <li>• Sequence Existing Nomenclature</li> <li>• Existing Systems Affected (Metasys, CRC, Jeron, Pegasys, etc.)</li> <li>• Controls Power same system as main HVAC</li> </ul>			
28	Training	<ul style="list-style-type: none"> <li>• PM&amp;R, Grounds, Graphics/HVAC shops</li> <li>• Hospital Staff</li> <li>• Engineer</li> </ul>			
29	<p>Are sole source items required? If so, what and is it submitted to GLAC?- Fire Alarm System- Security System &amp; Code Blue- Pneumatic Tube System- Medical Gas Alarms- Nurse Call- Isolation Room Controls- Doors, Hardware, Locks and Keying- Building Automation and HVAC Controls- Refrigerator Temperature Controls- Wander Guard- Modular Furniture- Patient Ceiling Lifts- Modular Brick- Automatic Transfer Switches- Electrical/Utility Metering- Interiors- Tile Grout Sealant- Firestop Systems</p>			Sole Source documents submitted to GLAC.	
30	AE - Submittal Log	<p>AE - Create Log AE - Determine Submittal's required before work can start AE - Determine submittal review time required before work can start</p>		AE to combine construction duration and submittal review time to determine overall contract completion.	

31	NTP - Submittal Log	Contractor - Verify Log Contractor - Verify at Precon Submittal's required before work can start and long lead time materials Contractor - Determine Work Start Date and provide notification of work start date and area based on submittal review time			
32	AE - Heat Detectors in Construction Space	AE to design initial layout based on: - 25 ft centers - common corridors - wire in series, tie into flow switch		AE to design. Plans to note "contractor to maintain and modify as needed".	
33	Construction Personnel are oriented to the following: - Need ID Badge - Safety, emergency response - HIPPA, privacy rights - Infection control - ILSM criteria				

**SECTION 01 32 16.13  
NETWORK ANALYSIS SYSTEM  
(P3, PDM FORMAT)**

**PART 1- GENERAL**

**1.1 DESCRIPTION:**

- A. The Contractor shall develop a Network Analysis System (NAS) plan and schedule demonstrating fulfillment of the contract requirements, shall keep the network up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) Precedence Diagramming Method (PDM) technique will be utilized to satisfy both time and cost applications. All schedule data and reports required under this specification section shall be based upon regular total float, not relative total float schedules. CPM to be submitted within 45 days of notice to proceed. Contractor can mobilize, however physical work on contract can not start until network analysis schedule is approved by the VA

**1.2 CONTRACTOR'S REPRESENTATIVE:**

- A. The Contractor shall designate an authorized representative in the firm who will be responsible for the preparation of the network diagram, review and report progress of the project with and to the Contracting Officer's representative.
- B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section and such authority shall not be interrupted throughout the duration of the project.
- C. The Contractor's representative shall engage the services of an outside consultant to complete the CPM. Consultants deemed pre-approved by VA: CCS/OS, Chicago, IL; Spire Consulting Group, Austin, TX.

### **1.3 CONTRACTOR'S CONSULTANT:**

- A. To prepare the network diagram, and diskette(s), which reflects the Contractor's project plan, the Contractor shall engage an independent CPM consultant who is skilled in the time and cost application of scheduling using (PDM) network techniques for construction projects, the cost of which is included in the Contractor's bid. This consultant shall not have any financial or business ties to the Contractor, and shall not be an affiliate or subsidiary company of the Contractor, and shall not be employed by an affiliate or subsidiary company of the Contractor.
- B. Prior to engaging a consultant, and within 10 calendar days after award of the contract, the Contractor shall submit to the Contracting Officer:
  - 1. The name and address of the proposed consultant.
  - 2. Sufficient information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
  - 3. A list of prior construction projects, along with selected PDM network diagram samples on current projects which the proposed consultant has performed complete project scheduling services. These network diagram samples must show complete project planning for a project of similar size and scope as covered under this contract.
- C. The Contracting Officer has the right to approve or disapprove employment of the proposed consultant, and will notify the Contractor of the VA decision within seven calendar days from receipt of information. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor must have their CPM Consultant approved prior to submitting any diagrams.

### **1.4 COMPUTER PRODUCED SCHEDULES**

- A. The contractor shall provide to the VA monthly computer processing of all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of Microsoft Project (mp\*) to the contracting officer's representative; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data in Microsoft Project (mp\*) batch format; and the resulting monthly updated schedule in a compressed electronic file in Microsoft Project (mp\*), (PDM) format. These must be submitted with and substantively support the contractor's monthly payment request and the signed look-a-head report. The resident engineer shall identify

the five different report formats that the contractor shall provide based upon the monthly schedule updates.

- B. The contractor is responsible for the correctness and timeliness of the computer-produced reports. The Contractor is also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.
- C. The VA shall report errors in computer-produced reports to the Contractor's representative within ten calendar days from receipt of reports. The Contractor will reprocess the computer-produced reports and associated diskette(s), when requested by the Contracting Officer's representative, to correct errors which affect the payment and schedule for the project.

#### **1.5 THE COMPLETE PROJECT NETWORK DIAGRAM SUBMITTAL**

- A. Within 45 calendar days (60 calendar days on projects over \$50,000,000) after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three blue line copies of the complete network diagram on sheets of paper 765 x 1070 mm (30 x 42 inches) and an electronic file in a compressed Microsoft Project (mp\*), (PDM) format. The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, duration, predecessor and successor relationships, trade code, area code, description, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start, only, without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the network diagram. The Contracting Officer's separate approval of the network diagram shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have a zero duration. The complete working network diagram shall reflect the Contractor's approach to scheduling the complete project. The final network diagram in its original form shall contain no contract changes or delays which may have

been incurred during the final network diagram development period and shall reflect the Contractors as bid schedule. These changes/delays shall be entered at the first update after the final network diagram has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, **ADJUSTMENT OF CONTRACT COMPLETION.**

- B. Within 30 calendar days after receipt of the complete project network diagram, the Contracting Officer or his representative will do one or both of the following:
  - 1. Notify the Contractor concerning his actions, opinions, and objections.
  - 2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised network diagram, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.
- C. The VA will process and return the approved baseline network diagram schedule data in a compressed electronic file in Microsoft Project (mp\*), (PDM) format on 3-1/2" diskette to the contractor for subsequent project schedule reporting and updating. This approved baseline network diagram schedule and the computer-produced schedule(s) generated there from shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

#### **1.6 WORK ACTIVITY/EVENT COST DATA**

- A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. In the event of disapproval, the Contractor shall revise and resubmit in accordance with Article, THE

COMPLETE PROJECT NETWORK DIAGRAM SUBMITTAL. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.

- B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in the General Conditions, Article, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (VA GENERAL CONDITIONS).
- C. In accordance with Article PERFORMANCE OF WORK BY THE CONTRACTOR in the Section, GENERAL CONDITIONS, the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events (referred to as "branches" in the GENERAL CONDITIONS) of the project for which the Contractor's forces will perform the work.
- D. The Contractor shall cost load work activities/events for ASBESTOS ABATEMENT. The sum of asbestos abatement work activity/event costs shall equal the value of the asbestos bid item in the Contractors' bid.
- E. The Contractor shall cost load work activities/events for all BID ITEMS. The sum of the cost loading for each bid item work activities/events shall equal the value of the item in the Contractors' bid.
- F. Work activities/events for Contractor bond shall have a trade code and area code of BOND.

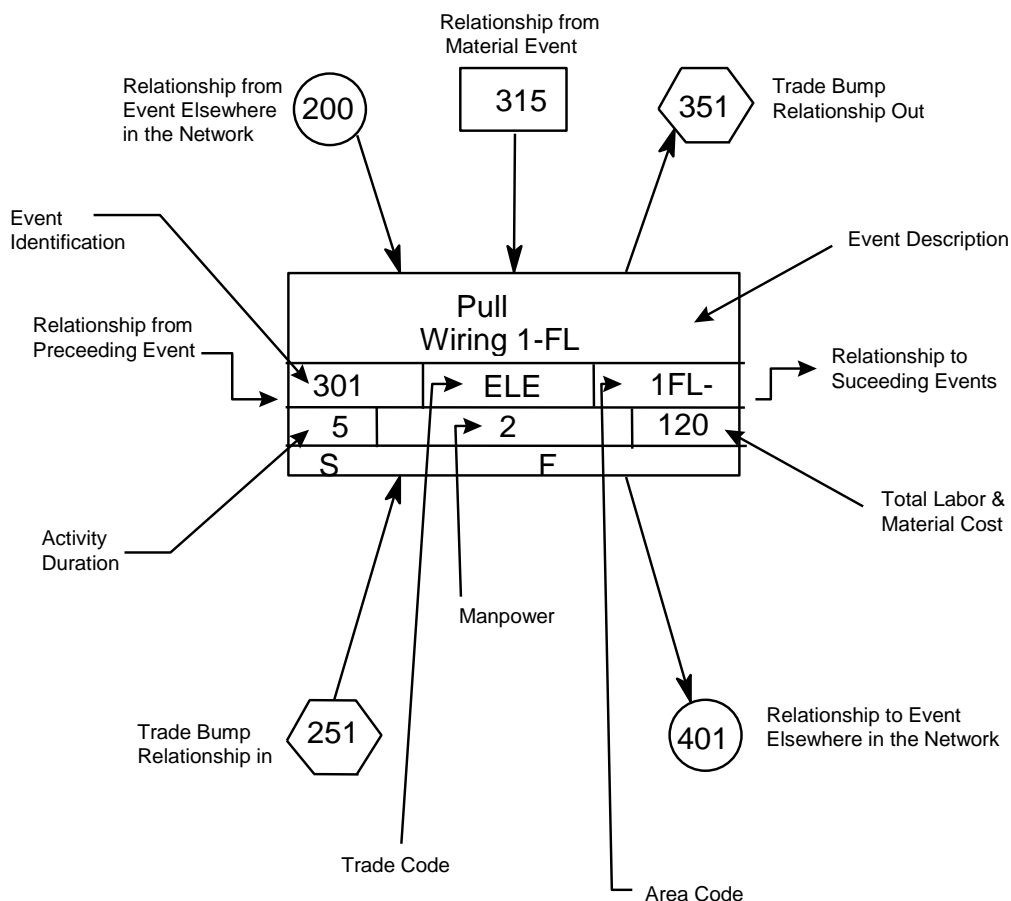
#### **1.7 NETWORK DIAGRAM REQUIREMENTS**

- A. Show on the network diagram the sequence and interdependence of work activities/events required for complete performance of all items of work. In preparing the network diagram, the Contractor shall:
  - 1. Exercise sufficient care to produce a clear, legible and accurate network diagram, refer to the drawing, CPM-1 (Sample CPM Network). Computer plotted network diagrams shall legibly display and plot all information required by the VA CPM activity/event legend or the computer plotted network diagram will not be acceptable. If the computer plotted network diagram is not found acceptable by the contracting officer's representative, then the network diagram will need to be hand drafted and meet legibility requirements. Group activities related to specific physical areas of the project, on the network diagram for ease of understanding and simplification. Provide a key plan on each network diagram sheet showing the project area associated with the work activities/events shown on that sheet.**
  - 2. Show the following on each work activity/event:**
    - a. Activity/Event ID number.

- b. Concise description of the work represented by the activity/event.  
(35 characters or less including spaces preferred).
- c. Performance responsibility or trade code (five alpha characters or less): GEN, MECH, ELEC, CARP, PLAST, or other acceptable abbreviations.
- d. Duration (in work days.)
- e. Cost (in accordance with Article, ACTIVITY/EVENT COST DATA of this section and less than \$9,999,999 per activity).
- f. Work location or area code (five characters or less), descriptive of the area involved.
- g. Manpower required (average number of men per day).
- h. The SYMBOL LEGEND format shown below and on the drawing, CPM-1 (Sample CPM Network) is mandatory and shall be followed in preparing final network diagrams.

# SYMBOL LEGEND

Show Network Diagram page number location(s) for all incoming/outgoing node connector(s).



3. Show activities/events as:

- a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
- b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
- c. Interruption of VA Medical Center utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.

- d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.
  - e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase. Schedule these activities/events so that only one phase is scheduled for completion within the same 30 consecutive calendar day period (except for those phases immediately preceding the final acceptance). Maintain this scheduling condition throughout the length of the contract unless waived by the Contracting Officer's representative in writing.
  - f. Bid items other than the Base Bid (ITEM 1) and Asbestos Abatement item shall have trade codes corresponding to the appropriate bid item number (e.g., ITM 3, ITM 4 and other items).
- 4. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
  - 5. Break up the work into activities/events of a duration no longer than 20 work days each, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the Contracting Officer may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals shall not be less than 20 work days. Refer to drawing CPM-1 for VA approval activities/events which will require minimum duration longer than 20 workdays. The construction time as determined by the CPM schedule from early start to late finish for any sub-phase, phase or the entire project shall not exceed the contract time(s) specified or shown.
  - 6. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
  - 7. Uniquely number each activity/event with numbers ranging from 1 to 99998 only. The network diagram should be generally numbered in sequence; left to right; top to bottom, and omitting numbers ending in 3, 6, and 9.

- B. Submit the following supporting data in addition to the network diagram, activity/event ID schedule and electronic file (s). Failure of the Contractor to include this data will delay the review of the submittal until the Contracting Officer is in receipt of the missing data:
1. The proposed number of working days per week.
  2. The holidays to be observed during the life of the contract (by day, month, and year).
  3. The planned number of shifts per day.
  4. The number of hours per shift.
  5. List the major construction equipment to be used on the site, describing how each piece relates to and will be used in support of the submitted network diagram work activities/events.
  6. Provide a typed, doubled spaced, description, at least one page in length, of the plan and your approach to constructing the project.
- C. To the extent that the network diagram or any revised network diagram shows anything not jointly agreed upon, it shall not be deemed to have been approved by the Contracting Officer. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the Contracting Officer's approval of the network diagram.
- D. Diskette Requirements and CPM Activity/Event Record Specifications:  
Submit to the VA an electronic file(s) containing one file of the data required to produce a Microsoft Project (mp\*), (PDM) produced schedule, reflecting all the activities/events of the complete project network diagram being submitted.
- E. Diskette Format: Only industry standard 3-1/2" diskettes, double sided, 1.4 megabytes, formatted using the MS-DOS operating system, are acceptable.
- F. Exterior Label Information:  
Provide the following information on an external label attached to each diskette(s):
1. VA project number and project location.
  2. Name and telephone number of a point of contact, preferably the person who created the diskette(s).
  3. Version number of the scheduling software used to create the diskette(s).
  4. The diskette number and total number of diskettes in the set (e.g., 1 of 5).
  5. The project data status date.

#### **1.8 PAYMENT TO THE CONTRACTOR:**

- A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS of Section GENERAL CONDITIONS. The Contractor is entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated computer-produced calendar-dated schedule unless, in special situations, the Contracting Officer permits an exception to this requirement. Monthly payment requests shall include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of Microsoft Project (mp\*), (PDM) to the contracting officer's representative; a listing of all project schedule changes, and associated data, made at the update; and an electronic file (s) of the resulting monthly updated schedule in a compressed Microsoft Project (mp\*), (PDM) format. These must be submitted with and substantively support the contractor's monthly application and certificate for payment request documents.
- B. When the Contractor fails or refuses to furnish to the Contracting Officer the information and the associated updated Microsoft Project (mp\*), (PDM) schedule in electronic format, which, in the sole judgment of the Contracting Officer, is necessary for processing the monthly progress payment, the Contractor shall not be deemed to have provided an estimate and supporting schedule data upon which progress payment may be made.

#### **1.9 PAYMENT AND PROGRESS REPORTING**

- A. Monthly job site progress meetings shall be held on dates mutually agreed to by the Contracting Officer (or Contracting Officer's representative) and the Contractor. Contractor and the CPM consultant will be required to attend all monthly progress meetings. Presence of Subcontractors during progress meeting is optional unless required by the Contracting Officer (or Contracting Officer's representative). The Contractor shall update the project schedule and all other data required by this section shall be accurately filled in and completed prior to the monthly progress meeting. The Contractor shall provide this information to the Contracting Officer or the VA representative in completed form three work days in advance of the progress meeting. Job progress will be reviewed to verify:

1. Actual start and/or finish dates for updated/completed activities/events.
  2. Remaining duration, required to complete each activity/event started, or scheduled to start, but not completed.
  3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the network diagram and computer-produced schedules. Changes in activity/event sequence and duration which have been made pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
  4. Percentage for completed and partially completed activities/events.
  5. Logic and duration revisions required by this section of the specifications.
  6. Activity/event duration and percent complete shall be updated independently.
- B. The Contractor shall submit a narrative report as a part of his monthly review and update, in a form agreed upon by the Contractor and the Contracting Officer. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities/events and completion dates; and an explanation of corrective action taken or proposed. This report is in addition to the daily reports pursuant to the provisions of Article, DAILY REPORT OF WORKERS AND MATERIALS in the GENERAL CONDITIONS.
- C. After completion of the joint review and the Contracting Officer's approval of all entries, the contractor will generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.
- D. After completing the monthly schedule update, the contractor's scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and resident engineer for the contract change(s). When there is a disagreement on logic and/or durations, the consultant shall use the schedule logic and/or durations provided and approved by the resident engineer. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to

the resident engineer within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**

- E. After VA acceptance and approval of the final network diagram, and after each monthly update, the contractor shall submit to the Contracting Officer three blue line copies of a revised complete network diagram showing all completed and partially completed activities/events, contract changes and logic changes made on the intervening updates or at the first update on the final diagram. The Contracting Officer may elect to have the contractor do this on a less frequent basis, but it shall be done on a quarterly basis as a minimum.
- F. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, RE office representatives, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

#### **1.10 RESPONSIBILITY FOR COMPLETION**

- A. Whenever it becomes apparent from the current monthly progress review meeting or the monthly computer-produced calendar-dated schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:

1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
  2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
  3. Reschedule the work in conformance with the specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the Contracting Officer for the proposed schedule changes. If such actions are approved, the CPM revisions shall be incorporated by the Contractor into the network diagram before the next update, at no additional cost to the Government.

**1.11 CHANGES TO NETWORK DIAGRAM AND SCHEDULE**

- A. Within 30 calendar days after VA acceptance and approval of any updated computer-produced schedule, the Contractor will submit a revised network diagram, the associated diskette(s), and a list of any activity/event changes including predecessors and successors for any of the following reasons:
1. Delay in completion of any activity/event or group of activities/events, indicate an extension of the project completion by 20 working days or 10 percent of the remaining project duration, whichever is less. Such delays which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
  2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
  3. The schedule does not represent the actual prosecution and progress of the project.
  4. When there is, or has been, a substantial revision to the activity/event costs of the network diagram regardless of the cause for these revisions.
- B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Medical Center, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, must be furnished in writing to the Contracting Officer for approval.

- C. Contracting Officer's approval for the revised network diagram and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the network diagram resulting from contract changes will be included in the proposal for changes in work as specified in Article, CHANGES of the GENERAL CONDITIONS, and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
- E. The cost of revisions to the network diagram not resulting from contract changes is the responsibility of the Contractor.

#### **1.12 ADJUSTMENT OF CONTRACT COMPLETION**

- A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the Contracting Officer may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.
- C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under Article, CHANGES, in the Section, GENERAL CONDITIONS. The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work

days) changes, and cost changes, for work in question and its relationship to other activities on the approved network diagram.

- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

**1.13 ADDITIONAL INSPECTIONS TO BE COMPLETED & ADDED TO CPM, BEYOND WHAT IS REQUIRED IN SPECIFIC SPECIFICATION SECTIONS.**

- A. Pre-site inspection of existing conditions.
- B. Demo Completion
- C. Hardware
- D. After punch list completion.

- - - E N D - - -

**SECTION 01 32 16.15**  
**PROJECT SCHEDULES**  
**(SMALL PROJECTS - DESIGN/BID/BUILD)**

**PART 1- GENERAL**

**1.1 DESCRIPTION:**

- A. The Contractor shall develop a Critical Path Method (CPM) plan and schedule demonstrating fulfillment of the contract requirements (Project Schedule), and shall keep the Project Schedule up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) technique shall be utilized to satisfy both time and cost applications.

**1.2 CONTRACTOR'S REPRESENTATIVE:**

- A. The Contractor shall designate an authorized representative responsible for the Project Schedule including preparation, review and progress reporting with and to the Contracting Officer's Representative (COR).
- B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section.
- C. The Contractor's representative shall have the option of developing the project schedule within their organization or to engage the services of an outside consultant. If an outside scheduling consultant is utilized, Section 1.3 of this specification will apply.

**1.3 CONTRACTOR'S CONSULTANT:**

- A. The Contractor shall submit a qualification proposal to the COR, within 10 days of bid acceptance. The qualification proposal shall include:
1. The name and address of the proposed consultant.
  2. Information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
  3. A representative sample of prior construction projects, which the proposed consultant has performed complete project scheduling services. These representative samples shall be of similar size and scope.
- B. The Contracting Officer has the right to approve or disapprove the proposed consultant, and will notify the Contractor of the VA decision within seven calendar days from receipt of the qualification proposal.

In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor shall have their scheduling consultant approved prior to submitting any schedule for approval.

#### **1.4 COMPUTER PRODUCED SCHEDULES**

- A. The contractor shall provide monthly, to the Department of Veterans Affairs (VA), all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of the scheduling software approved by the Contracting Officer; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data; and the resulting monthly updated schedule in PDM format. These must be submitted with and substantively support the contractor's monthly payment request and the signed look ahead report. The COR shall identify the five different report formats that the contractor shall provide.
- B. The contractor shall be responsible for the correctness and timeliness of the computer-produced reports. The Contractor shall also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.
- C. The VA will report errors in computer-produced reports to the Contractor's representative within ten calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports and associated diskette(s), when requested by the Contracting Officer's representative, to correct errors which affect the payment and schedule for the project.

#### **1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL**

- A. Within 45 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three blue line copies of the interim schedule on sheets of paper 765 x 1070 mm (30 x 42 inches) and an electronic file in the previously approved CPM schedule program. The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, activity/event description, duration, budget amount, early start date, early finish date, late start date, late finish date and total float. Work

activity/event relationships shall be restricted to finish-to-start or start-to-start without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the network diagram. The Contracting Officer's separate approval of the Project Schedule shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have zero duration. The complete working schedule shall reflect the Contractor's approach to scheduling the complete project. **The final Project Schedule in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents.** These changes/delays shall be entered at the first update after the final Project Schedule has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.

- D. Within 30 calendar days after receipt of the complete project interim Project Schedule and the complete final Project Schedule, the Contracting Officer or his representative, will do one or both of the following:
1. Notify the Contractor concerning his actions, opinions, and objections.
  2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised Project Schedule, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.
- E. The approved baseline schedule and the computer-produced schedule(s) generated there from shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

F. The Complete Project Schedule shall contain approximately 15 work activities/events.

#### **1.6 WORK ACTIVITY/EVENT COST DATA**

- A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.
- B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in Article, FAR 52.232 - 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 - 83 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS).
- C. In accordance with FAR 52.236 - 1 (PERFORMANCE OF WORK BY THE CONTRACTOR) and VAAR 852.236 - 72 (PERFORMANCE OF WORK BY THE CONTRACTOR), the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events of the project for which the Contractor's forces will perform the work.
- D. The Contractor shall cost load work activities/events for all BID ITEMS including ASBESTOS ABATEMENT. The sum of each BID ITEM work shall equal the value of the bid item in the Contractors' bid.

#### **1.7 PROJECT SCHEDULE REQUIREMENTS**

- A. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor Shall:
  - 1. Show activities/events as:
    - a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
    - b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.

- c. Interruption of VA Facilities utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
  - d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.
  - e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase.
2. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
3. Break up the work into activities/events of a duration no longer than 20 work days each or one reporting period, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the COR may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals will not be less than 20 work days.
4. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
5. The schedule shall be generally numbered in such a way to reflect either discipline, phase or location of the work.
- B. The Contractor shall submit the following supporting data in addition to the project schedule:
  1. The appropriate project calendar including working days and holidays.
  2. The planned number of shifts per day.
  3. The number of hours per shift.Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.
- C. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COR. Failure to include any element of work

required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COR's approval of the Project Schedule.

- D. Compact Disk Requirements and CPM Activity/Event Record Specifications: Submit to the VA an electronic file(s) containing one file of the data required to produce a schedule, reflecting all the activities/events of the complete project schedule being submitted.

#### **1.8 PAYMENT TO THE CONTRACTOR:**

- A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, FAR 52.232 - 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 - 83 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS). The Contractor shall be entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated project schedule. Monthly payment requests shall include: a listing of all agreed upon project schedule changes and associated data; and an electronic file (s) of the resulting monthly updated schedule.
- B. Approval of the Contractor's monthly Application for Payment shall be contingent, among other factors, on the submittal of a satisfactory monthly update of the project schedule.

#### **1.9 PAYMENT AND PROGRESS REPORTING**

- A. Monthly schedule update meetings will be held on dates mutually agreed to by the COR and the Contractor. Contractor and their CPM consultant (if applicable) shall attend all monthly schedule update meetings. The Contractor shall accurately update the Project Schedule and all other data required and provide this information to the COR three work days in advance of the schedule update meeting. Job progress will be reviewed to verify:
1. Actual start and/or finish dates for updated/completed activities/events.
  2. Remaining duration for each activity/event started, or scheduled to start, but not completed.
  3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Project Schedule.

4. Changes in activity/event sequence and/or duration which have been made, pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
  5. Completion percentage for all completed and partially completed activities/events.
  6. Logic and duration revisions required by this section of the specifications.
  7. Activity/event duration and percent complete shall be updated independently.
- B. After completion of the joint review, the contractor shall generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.
- C. After completing the monthly schedule update, the contractor's representative or scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and Resident Engineer for the contract change(s). When there is a disagreement on logic and/or durations, the Contractor shall use the schedule logic and/or durations provided and approved by the Resident Engineer. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the Resident Engineer within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**
- D. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, RE office representatives, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work

activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

#### **1.10 RESPONSIBILITY FOR COMPLETION**

- A. If it becomes apparent from the current revised monthly progress schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:
  - 1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
  - 2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
  - 3. Reschedule the work in conformance with the specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the COR for the proposed schedule changes. If such actions are approved, the representative schedule revisions shall be incorporated by the Contractor into the Project Schedule before the next update, at no additional cost to the Government.

#### **1.11 CHANGES TO THE SCHEDULE**

- A. Within 30 calendar days after VA acceptance and approval of any updated project schedule, the Contractor shall submit a revised electronic file (s) and a list of any activity/event changes including predecessors and successors for any of the following reasons:
  - 1. Delay in completion of any activity/event or group of activities/events, which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.

2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
  3. The schedule does not represent the actual prosecution and progress of the project.
  4. When there is, or has been, a substantial revision to the activity/event costs regardless of the cause for these revisions.
- B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Facility, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, shall be furnished in writing to the Contracting Officer for approval.
- C. Contracting Officer's approval for the revised project schedule and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes in work as specified in FAR 52.243 - 4 (Changes) and VAAR 852.236 - 88 (Changes - Supplemental), and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
- E. The cost of revisions to the Project Schedule not resulting from contract changes is the responsibility of the Contractor.

#### **1.12 ADJUSTMENT OF CONTRACT COMPLETION**

- A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the COR may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and

predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.

- C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under FAR 52.243 - 4 (Changes) and VAAR 852.236 - 88 (Changes - Supplemental). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes, for work in question and its relationship to other activities on the approved network diagram.
- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

**1.13 ADDITIONAL INSPECTIONS TO BE COMPLETED & ADDED TO CPM, BEYOND WHAT IS REQUIRED IN SPECIFIC SPECIFICATION SECTIONS.**

- A. Pre-site inspection of existing conditions.
- B. Demo Completion
- C. Hardware
- D. After punch list completion.

- - - E N D - - -

03-01-12

**SECTION 01 33 23**  
**SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**

- 1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
- 1-2. For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.
- 1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
  - A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
  - B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
  - C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- 1-4. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submission to assure adequate lead time for procurement of contract - required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.
- 1-5. Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and action thereon will be taken by COR on behalf of the Contracting Officer.
- 1-6. Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.
- 1-7. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant

03-01-12

to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

- 1-8. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect-Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.
- 1-9. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.
  - A. Submit samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in quadruplicate, except where a greater number is specified.
  - B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.
    1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
    2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
    3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

03-01-12

- C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.
- D. Approved samples will be kept on file by the COR at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.
  - 1. For each drawing required, submit one legible photographic paper or vellum reproducible.
  - 2. Reproducible shall be full size.
  - 3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
  - 4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
  - 5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
  - 6. One reproducible print of approved or disapproved shop drawings will be forwarded to Contractor.
  - 7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

03-01-12

1-10. Samples, shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to:

Chequamegon Bay Group  
933 N. Mayfair Road,  
Suite #320  
Milwaukee, WI 53226

1-11. At the time of transmittal to the Architect-Engineer, the Contractor shall also send a copy of the complete submittal directly to the COR.

- - - E N D - - -

**SECTION 01 42 19**  
**REFERENCE STANDARDS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

**1.2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)**

- A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to - GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.
- B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

**1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)**

The specifications and standards cited in this solicitation can be examined at the following location:

DEPARTMENT OF VETERANS AFFAIRS  
Office of Construction & Facilities Management  
Facilities Quality Service (00CFM1A)  
425 Eye Street N.W, (sixth floor)  
Washington, DC 20001  
Telephone Numbers: (202) 632-5249 or (202) 632-5178  
Between 9:00 AM - 3:00 PM

**1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)**

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA	Aluminum Association Inc. <a href="http://www.aluminum.org">http://www.aluminum.org</a>
AABC	Associated Air Balance Council <a href="http://www.aabchq.com">http://www.aabchq.com</a>
AAMA	American Architectural Manufacturer's Association <a href="http://www.aamanet.org">http://www.aamanet.org</a>
AAN	American Nursery and Landscape Association <a href="http://www.anla.org">http://www.anla.org</a>
AASHTO	American Association of State Highway and Transportation Officials <a href="http://www.aashto.org">http://www.aashto.org</a>
AATCC	American Association of Textile Chemists and Colorists <a href="http://www.aatcc.org">http://www.aatcc.org</a>
ACGIH	American Conference of Governmental Industrial Hygienists <a href="http://www.acgih.org">http://www.acgih.org</a>
ACI	American Concrete Institute <a href="http://www.aci-int.net">http://www.aci-int.net</a>
ACPA	American Concrete Pipe Association <a href="http://www.concrete-pipe.org">http://www.concrete-pipe.org</a>
ACPPA	American Concrete Pressure Pipe Association <a href="http://www.acppa.org">http://www.acppa.org</a>
ADC	Air Diffusion Council <a href="http://flexibleduct.org">http://flexibleduct.org</a>
AGA	American Gas Association <a href="http://www.aga.org">http://www.aga.org</a>
AGC	Associated General Contractors of America <a href="http://www.agc.org">http://www.agc.org</a>

AGMA	American Gear Manufacturers Association, Inc. <a href="http://www.agma.org">http://www.agma.org</a>
AHAM	Association of Home Appliance Manufacturers <a href="http://www.aham.org">http://www.aham.org</a>
AISC	American Institute of Steel Construction <a href="http://www.aisc.org">http://www.aisc.org</a>
AISI	American Iron and Steel Institute <a href="http://www.steel.org">http://www.steel.org</a>
AITC	American Institute of Timber Construction <a href="http://www.aitc-glulam.org">http://www.aitc-glulam.org</a>
AMCA	Air Movement and Control Association, Inc. <a href="http://www.amca.org">http://www.amca.org</a>
ANLA	American Nursery & Landscape Association <a href="http://www.anla.org">http://www.anla.org</a>
ANSI	American National Standards Institute, Inc. <a href="http://www.ansi.org">http://www.ansi.org</a>
APA	The Engineered Wood Association <a href="http://www.apawood.org">http://www.apawood.org</a>
ARI	Air-Conditioning and Refrigeration Institute <a href="http://www.ari.org">http://www.ari.org</a>
ASAE	American Society of Agricultural Engineers <a href="http://www.asae.org">http://www.asae.org</a>
ASCE	American Society of Civil Engineers <a href="http://www.asce.org">http://www.asce.org</a>
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers <a href="http://www.ashrae.org">http://www.ashrae.org</a>
ASME	American Society of Mechanical Engineers <a href="http://www.asme.org">http://www.asme.org</a>
ASSE	American Society of Sanitary Engineering <a href="http://www.asse-plumbing.org">http://www.asse-plumbing.org</a>

ASTM	American Society for Testing and Materials <a href="http://www.astm.org">http://www.astm.org</a>
AWI	Architectural Woodwork Institute <a href="http://www.awinet.org">http://www.awinet.org</a>
AWS	American Welding Society <a href="http://www.aws.org">http://www.aws.org</a>
AWWA	American Water Works Association <a href="http://www.awwa.org">http://www.awwa.org</a>
BHMA	Builders Hardware Manufacturers Association <a href="http://www.buildershardware.com">http://www.buildershardware.com</a>
BIA	Brick Institute of America <a href="http://www.bia.org">http://www.bia.org</a>
BSI	Building Stone Institute <a href="http://www.buildingstoneinstitute.org">http://www.buildingstoneinstitute.org</a>
CAGI	Compressed Air and Gas Institute <a href="http://www.cagi.org">http://www.cagi.org</a>
CGA	Compressed Gas Association, Inc. <a href="http://www.cganet.com">http://www.cganet.com</a>
CI	The Chlorine Institute, Inc. <a href="http://www.chlorineinstitute.org">http://www.chlorineinstitute.org</a>
CISCA	Ceilings and Interior Systems Construction Association <a href="http://www.cisca.org">http://www.cisca.org</a>
CISPI	Cast Iron Soil Pipe Institute <a href="http://www.cispi.org">http://www.cispi.org</a>
CLFMI	Chain Link Fence Manufacturers Institute <a href="http://www.chainlinkinfo.org">http://www.chainlinkinfo.org</a>
CPMB	Concrete Plant Manufacturers Bureau <a href="http://www.cpmc.org">http://www.cpmc.org</a>
CRA	California Redwood Association <a href="http://www.calredwood.org">http://www.calredwood.org</a>

CRSI	Concrete Reinforcing Steel Institute <a href="http://www.crsi.org">http://www.crsi.org</a>
CTI	Cooling Technology Institute <a href="http://www.cti.org">http://www.cti.org</a>
DHI	Door and Hardware Institute <a href="http://www.dhi.org">http://www.dhi.org</a>
EGSA	Electrical Generating Systems Association <a href="http://www.egsa.org">http://www.egsa.org</a>
EEI	Edison Electric Institute <a href="http://www.eei.org">http://www.eei.org</a>
EPA	Environmental Protection Agency <a href="http://www.epa.gov">http://www.epa.gov</a>
ETL	ETL Testing Laboratories, Inc. <a href="http://www.etl.com">http://www.etl.com</a>
FAA	Federal Aviation Administration <a href="http://www.faa.gov">http://www.faa.gov</a>
FCC	Federal Communications Commission <a href="http://www.fcc.gov">http://www.fcc.gov</a>
FPS	The Forest Products Society <a href="http://www.forestprod.org">http://www.forestprod.org</a>
GANA	Glass Association of North America <a href="http://www.cssinfo.com/info/gana.html/">http://www.cssinfo.com/info/gana.html/</a>
FM	Factory Mutual Insurance <a href="http://www.fmglobal.com">http://www.fmglobal.com</a>
GA	Gypsum Association <a href="http://www.gypsum.org">http://www.gypsum.org</a>
GSA	General Services Administration <a href="http://www.gsa.gov">http://www.gsa.gov</a>
HI	Hydraulic Institute <a href="http://www.pumps.org">http://www.pumps.org</a>

HPVA	Hardwood Plywood & Veneer Association <a href="http://www.hpva.org">http://www.hpva.org</a>
ILI	Indiana Limestone Institute of America <a href="http://www.iliai.com">http://www.iliai.com</a>
ICBO	International Conference of Building Officials <a href="http://www.icbo.org">http://www.icbo.org</a>
ICEA	Insulated Cable Engineers Association Inc. <a href="http://www.icea.net">http://www.icea.net</a>
\ICAC	Institute of Clean Air Companies <a href="http://www.icac.com">http://www.icac.com</a>
IEEE	Institute of Electrical and Electronics Engineers <a href="http://www.ieee.org/">http://www.ieee.org/</a>
IMSA	International Municipal Signal Association <a href="http://www.imsasafety.org">http://www.imsasafety.org</a>
IPCEA	Insulated Power Cable Engineers Association
NBMA	Metal Buildings Manufacturers Association <a href="http://www.mbma.com">http://www.mbma.com</a>
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry Inc. <a href="http://www.mss-hq.com">http://www.mss-hq.com</a>
NAAMM	National Association of Architectural Metal Manufacturers <a href="http://www.naamm.org">http://www.naamm.org</a>
NAPHCC	Plumbing-Heating-Cooling Contractors Association <a href="http://www.phccweb.org.org">http://www.phccweb.org.org</a>
NBS	National Bureau of Standards See - NIST
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors <a href="http://www.nationboard.org">http://www.nationboard.org</a>
NEC	National Electric Code See - NFPA National Fire Protection Association

NEMA	National Electrical Manufacturers Association <a href="http://www.nema.org">http://www.nema.org</a>
NFPA	National Fire Protection Association <a href="http://www.nfpa.org">http://www.nfpa.org</a>
NHLA	National Hardwood Lumber Association <a href="http://www.natlhardwood.org">http://www.natlhardwood.org</a>
NIH	National Institute of Health <a href="http://www.nih.gov">http://www.nih.gov</a>
NIST	National Institute of Standards and Technology <a href="http://www.nist.gov">http://www.nist.gov</a>
NLMA	Northeastern Lumber Manufacturers Association, Inc. <a href="http://www.nelma.org">http://www.nelma.org</a>
NPA	National Park Service <a href="http://www.nps.gov">http://www.nps.gov</a>
NPA	National Particleboard Association 18928 Premiere Court Gaithersburg, MD 20879 (301) 670-0604
NSF	National Sanitation Foundation <a href="http://www.nsf.org">http://www.nsf.org</a>
NWWDA	Window and Door Manufacturers Association <a href="http://www.nwwda.org">http://www.nwwda.org</a>
OSHA	Occupational Safety and Health Administration Department of Labor <a href="http://www.osha.gov">http://www.osha.gov</a>
PCA	Portland Cement Association <a href="http://www.portcement.org">http://www.portcement.org</a>
PCI	Precast Prestressed Concrete Institute <a href="http://www.pci.org">http://www.pci.org</a>
PPI	The Plastic Pipe Institute <a href="http://www.plasticpipe.org">http://www.plasticpipe.org</a>

PEI	Porcelain Enamel Institute, Inc. <a href="http://www.porcelainenamel.com">http://www.porcelainenamel.com</a>
PTI	Post-Tensioning Institute <a href="http://www.post-tensioning.org">http://www.post-tensioning.org</a>
RFCI	The Resilient Floor Covering Institute <a href="http://www.rfci.com">http://www.rfci.com</a>
RIS	Redwood Inspection Service See - CRA
RMA	Rubber Manufacturers Association, Inc. <a href="http://www.rma.org">http://www.rma.org</a>
SCMA	Southern Cypress Manufacturers Association <a href="http://www.cypressinfo.org">http://www.cypressinfo.org</a>
SDI	Steel Door Institute <a href="http://www.steeldoor.org">http://www.steeldoor.org</a>
IGMA	Insulating Glass Manufacturers Alliance <a href="http://www.igmaonline.org">http://www.igmaonline.org</a>
SJI	Steel Joist Institute <a href="http://www.steeljoist.org">http://www.steeljoist.org</a>
SMACNA	Sheet Metal and Air-Conditioning Contractors National Association, Inc. <a href="http://www.smacna.org">http://www.smacna.org</a>
SSPC	The Society for Protective Coatings <a href="http://www.sspc.org">http://www.sspc.org</a>
STI	Steel Tank Institute <a href="http://www.steeltank.com">http://www.steeltank.com</a>
SWI	Steel Window Institute <a href="http://www.steelwindows.com">http://www.steelwindows.com</a>
TCA	Tile Council of America, Inc. <a href="http://www.tileusa.com">http://www.tileusa.com</a>
TEMA	Tubular Exchange Manufacturers Association <a href="http://www.tema.org">http://www.tema.org</a>

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

09-11

TPI        Truss Plate Institute, Inc.  
          583 D'Onofrio Drive; Suite 200  
          Madison, WI 53719  
          (608) 833-5900

UBC        The Uniform Building Code  
          See ICBO

UL         Underwriters' Laboratories Incorporated  
          <http://www.ul.com>

ULC        Underwriters' Laboratories of Canada  
          <http://www.ulc.ca>

WCLIB      West Coast Lumber Inspection Bureau  
          6980 SW Varns Road, P.O. Box 23145  
          Portland, OR 97223  
          (503) 639-0651

WRCLA      Western Red Cedar Lumber Association  
          P.O. Box 120786  
          New Brighton, MN 55112  
          (612) 633-4334

WWPA      Western Wood Products Association  
          <http://www.wwpa.org>

- - - E N D - - -

**SECTION 01 57 19**  
**TEMPORARY ENVIRONMENTAL CONTROLS**

**EP-1. DESCRIPTION**

- A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.
- B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
  - 1. Adversely effect human health or welfare,
  - 2. Unfavorably alter ecological balances of importance to human life,
  - 3. Effect other species of importance to humankind, or;
  - 4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.
- C. Definitions of Pollutants:
  - 1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
  - 2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
  - 3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
  - 4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
  - 5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.
  - 6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:

- a. Sewage: Domestic sanitary sewage and human and animal waste.
- b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

**EP-2. QUALITY CONTROL**

- A. Establish and maintain quality control for the environmental protection of all items set forth herein.
- B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

**EP-3. REFERENCES**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. U.S. National Archives and Records Administration (NARA):  
33 CFR 328.....Definitions

**EP-4. SUBMITTALS**

- A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
  - 1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the COR to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the COR for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
    - a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
    - b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
    - c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
    - d. Description of the Contractor's environmental protection personnel training program.
    - e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's

proposed operations and the requirements imposed by those laws, regulations, and permits.

- f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
  - g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
  - h. Permits, licenses, and the location of the solid waste disposal area.
  - i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
  - j. Environmental Monitoring Plans for the job site including land, water, air, and noise.
  - k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.
- B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

**EP-5. PROTECTION OF ENVIRONMENTAL RESOURCES**

- A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
- B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the COR. Do not fasten or attach ropes, cables, or guys to trees for

anchorage unless specifically authorized, or where special emergency use is permitted.

1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
  - a. Box and protect from damage existing trees and shrubs to remain on the construction site.
  - b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
  - c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.
  - a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local 2009 (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.
  - b. Reuse or conserve the collected topsoil sediment as directed by the COR.
  - c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.
5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that

- water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.
6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
  7. Manage and control spoil areas on Government property to limit spoil to areas and prevent erosion of soil or sediment from entering nearby water courses or lakes.
  8. Protect adjacent areas from despoilment by temporary excavations and embankments.
  9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
  10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
  11. Handle discarded materials other than those included in the solid waste category as directed by the COR.
- C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
  2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
  3. Monitor water areas affected by construction.
- D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning

construction operations, list species that require specific attention along with measures for their protection.

- E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Wisconsin and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.
1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
  2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
  3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
  4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.
- F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the COR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.
1. Perform construction activities involving repetitive, high-level impact noise only between 6:00 p.m. and 10:00p.m unless otherwise permitted by local ordinance or the COR. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80

Less than 12 minutes of any hour

75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:
  - a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80
PUMPS	75	BLASTING	--
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

- b. Use shields or other physical barriers to restrict noise transmission.
  - c. Provide soundproof housings or enclosures for noise-producing machinery.
  - d. Use efficient silencers on equipment air intakes.
  - e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.
  - f. Line hoppers and storage bins with sound deadening material.
  - g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.
3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face.

Submit the recorded information to the COR noting any problems and the alternatives for mitigating actions.

- G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.
- H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the COR. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

- - - E N D - - -

**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused. Contractor is required to restore all finishes, surfaces, items, & materials as required accommodating new finishes. For example, if wall paper, vinyl wall covering, ceramic wall tile, etc. is existing on wall, and new wall finish calls for wall to be painted, contractor is required to remove existing wall paper, vinyl wall covering, ceramic wall tile, etc. to accommodate new painted finish. These surfaces are required to be verified prior to bid, as no change to contract will be provided after award if existing finishes are clearly present.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
  - 1. Waste Management Plan development and implementation.
  - 2. Techniques to minimize waste generation.
  - 3. Sorting and separating of waste materials.
  - 4. Salvage of existing materials and items for reuse or resale.
  - 5. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
  - 1. Soil.
  - 2. Inerts (eg, concrete, masonry and asphalt).
  - 3. Clean dimensional wood and palette wood.
  - 4. Green waste (biodegradable landscaping materials).
  - 5. Engineered wood products (plywood, particle board and I-joists, etc).
  - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
  - 7. Cardboard, paper and packaging.
  - 8. Bitumen roofing materials.

09-01-13

9. Plastics (eg, ABS, PVC).
10. Carpet and/or pad.
11. Gypsum board.
12. Insulation.
13. Paint.
14. Fluorescent lamps.

## **1.2 RELATED WORK**

- A. Section 02 41 00, DEMOLITION.
- B. Section 01 00 00, GENERAL REQUIREMENTS.
- C. Lead Paint: Section 02 83 33.13, LEAD BASED PAINT REMOVAL AND DISPOSAL.

## **1.3 QUALITY ASSURANCE**

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction Demolition waste includes products of the following:
  1. Excess or unusable construction materials.
  2. Packaging used for construction products.
  3. Poor planning and/or layout.
  4. Construction error.
  5. Over ordering.
  6. Weather damage.
  7. Contamination.
  8. Mishandling.
  9. Breakage.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
- C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.
- D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
- E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the

09-01-13

extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.wbdg.org/tools/cwm.php> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.

- F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
- G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
- H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

#### **1.4 TERMINOLOGY**

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of landfilling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality

09-01-13

objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.

- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
  - 1. On-site Recycling - Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
  - 2. Off-site Recycling - Materials hauled to a location and used in an altered form in the manufacture of new products.
- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.
- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

09-01-13

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

#### **1.5 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:
- B. Prepare and submit to the COR a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
  - 1. Procedures to be used for debris management.
  - 2. Techniques to be used to minimize waste generation.
  - 3. Analysis of the estimated job site waste to be generated:
    - a. List of each material and quantity to be salvaged, reused, recycled.
    - b. List of each material and quantity proposed to be taken to a landfill.
  - 4. Detailed description of the Means/Methods to be used for material handling.
    - a. On site: Material separation, storage, protection where applicable.
    - b. Off site: Transportation means and destination. Include list of materials.
      - 1) Description of materials to be site-separated and self-hauled to designated facilities.
      - 2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
    - c. The names and locations of mixed debris reuse and recycling facilities or sites.
    - d. The names and locations of trash disposal landfill facilities or sites.
    - e. Documentation that the facilities or sites are approved to receive the materials.
- C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

- D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

#### **1.6 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.
- B. U.S. Green Building Council (USGBC):  
LEED Green Building Rating System for New Construction

#### **1.7 RECORDS**

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS**

- A. List of each material and quantity to be salvaged, recycled, reused.
- B. List of each material and quantity proposed to be taken to a landfill.
- C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

### **PART 3 - EXECUTION**

#### **3.1 COLLECTION**

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.
- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

#### **3.2 DISPOSAL**

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

### 3.3 REPORT

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.
- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.
- C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

### 3.4 REQUIRED TABLES:

**To be completed by Contractor and Supplied to VA.**

Project Name: _____		Location: _____		Project Contractor: _____	
COTR: _____					
Date: _____					
Material Being Reused/Recycled	Reused/Recycled	Quantity (lbs or cubic yards)	Recycler/Location	Comments	
Masonry					
Concrete					
Scrap Metals					
Packaging					
Drywall					
Wood					
Plumbing Fixtures					
Glass					
Plastics (noncontaminated)					
Acoustical Ceiling Tile					
Wire					
Light Fixtures					
Lamps					
Ballasts					
Carpeting					

Project Name: _____		Location: _____		Project Contractor: _____	
COTR: _____					
Date: _____					
<b>KEY:</b>					
<b>( R ) = Recycled Content</b>					
<b>(ES) = Energy Star</b>					
<b>(BP) = Biobased Product</b>					
<b>(FEMP) = FEMP-Designated Product</b>					
Product: What specific product was purchased?					
"Green" Content: What makes it green? % recycled, biobased, energy star, etc.					
Material	Product	"Green" Content	Manufacturer	Comments	
Appliances ( R )					
Bathroom Fixtures ( R )					
Building Insulation (R,ES)					
Cement and Concrete ( R )					
Composite panels (BP)					
Doors and skylights (ES)					
Floor tiles (R)					
Laminated paperboard (R)					
Structural fiberboard					
Roofing materials (R, BP, ES)					
Windows (ES)					
Office furniture					
Carpet (R)					
Carpet cushion (R)					
Compact fluorescent lamps (CFLs) (ES)					
Decorative light strings (ES)					
Downlight luminaires (FEMP)					
Fluorescent ballasts (FEMP)					
Fluorescent luminaires (FEMP)					
Fluorescent tube lamps (FEMP)					
LED lighting					
Light fixtures (ES)					
Lighting controls (FEMP)					
Mats (R)					
Paint -- consolidated latex paint (R)					
Paint -- reprocessed latex paint (R)					
Bike racks (R)					
Plastic fencing (R)					
Signage (R)					
Adhesive and Mastic Removers (BP)					
Carpet and Upholstery Cleaners - General Purpose (BP)					
Carpet and Upholstery Cleaners - Spot Removers (BP)					
Dust Suppressants (BP)					
Floor Strippers (BP)					
Graffiti and Grease Removers (BP)					
Sorbents (BP)					
Mats (R)					
Wood and concrete sealers (BP)					

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

09-01-13

- - - E N D - - -

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

Attachment A - Sample Construction Waste Management Plan

## **Introduction.**

This site based **Construction Waste Management Plan** has been developed to manage the non-hazardous building construction and demolition waste by diverting waste from the landfills through salvaging, recycling, or reusing building materials for the Department of Veterans Affairs during construction activities. The Construction Waste Management Plan has been designed to establish records to quantify construction and demolition debris diversion and disposal. Based on the work that is scheduled to be part of the contract and the engineering practices to be implemented in conjunction with the work, every effort is being made to protect the people, assets, and the environment of the Department of Veterans Affairs.

## **Contents.**

### ORGANIZATION AND RESPONSIBILITIES

- Job Site Superintendent
- General Contractor
- All Other On-site Personnel
- Construction/Renovation Area

### SITE DESCRIPTION

### PERSONNEL

### WASTE MANAGEMENT GOALS

### PLAN IMPLEMENTATION, OVERSIGHT & ENFORCEMENT

### MEETINGS & COMMUNICATION

### SITE ASSESSMENT DISPOSAL AND HANDLING

### WASTE AUDITING PROCEDURES

### WASTE MANAGEMENT DOCUMENTATION

## **Personnel Organization and Responsibilities.**

This construction project has been authorized by and is under the supervision of the Department of Veterans Affairs, Milwaukee, WI.

**Job Site Superintendent:** [Superintendent Name] will be the on-site employee responsible for the implementation and enforcement of the Construction Waste Management Plan and is so delegated by [Prime Contractor Name].

**Prime Contractor:** [Prime Contractor Name] will oversee the work of all construction staff and subcontractors. The Contractor will be responsible for instituting the measures as outlined in this Construction Waste Management Plan and ensuring their effectiveness.

**All Other On-site Personnel:** All other on-site construction personnel, including all subcontractors, will be responsible for adhering to the Construction Waste Management Plan as established by [Prime Contractor Name] as well as any additional practices, laws, and regulations for ensuring a safe work environment.

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

Attachment A - Sample Construction Waste Management Plan

**Construction/Renovation Area:** The work will take place at the Department of Veterans Affairs Medical Center, Milwaukee Wisconsin. The main construction area is contained at the [Contract Location] as shown on the drawings.

**Site Description.**

The worksite is an enclosed steel, concrete and masonry building structure.

**Personnel.**

As required in Specification Section 01 74 19 Construction Waste Management: All construction workers will be aware of the Construction Waste Management Plan through the project's Pre-Construction Meeting as well as the Project Kick-Off Meeting conducted by [Prime Contractor Name]. The meetings will consist of the information contained in this Construction Waste Management Plan, including, but not limited to; the construction limits, waste management goals, plan implementation, oversight and enforcement, meetings and communication, documentation, site assessment-expected wastes, disposal and handling, trade contractor waste management plan, waste management progress report, and work area limits, as well as the safety guidelines of the VA. Upon completing this briefing [Superintendent Name] will enforce the Construction Waste Management Plan throughout the life of the project. Weekly contractor meetings will include the Construction Waste Management Plan as well as the Environmental Protection Plan in section 01 57 19 to ensure new and all workers onsite are aware of the requirements and procedures.

**Waste Management Goals.**

This Construction Waste Management Plan is the responsibility of the Prime Contractor and to be enforced for all subcontractors by the Prime Contractor. By effectively managing this Construction Waste Management Plan, [Prime Contractor Name] will recycle or salvage (for reuse) all feasible materials to a minimum of **50 percent by weight**.

The Waste Management Plan outlines the expected wastes to be confronted on site, means of disposal and handling methods, and required documentation. The [Prime Contractor Name] will provide non hazardous waste manifest identifying weight of all waste generated per delivery (dumpster)

This Construction Waste Management Plan is in conjunction with specification section 01 74  
19 Construction Waste Management.

[Prime Contractor Name] will monitor, implement, and document this plan throughout the construction of this project. Monitoring of on-site compliance with this plan will be performed by the [Prime Contractor Name] Superintendents on a daily basis. During demolition, the demolition contractor will provide one metal scrap dumpster and one mixed waste dumpster that will be used for all materials. The metal dumpster will be taken by [Demolition Subcontractor Name, Address] for recycling. The mixed waste dumpster will be taken to [Company 1 Name, address], where it will be sorted and separated for recycling. Any non-recyclable material will be sent to landfill. Recyclable material will be weighed and recorded by [Company 1 Name, address]. During reconstruction there will be one dumpster provided for

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

Attachment A - Sample Construction Waste Management Plan

mixed waste. The mixed waste dumpster will be taken to [Company 2 Name], where it will be sorted and separated for recycling. Records will be provided in accordance with LEED Reference Guide and LEED Template. The reports will be submitted monthly.

**Meetings and Communication.**

Each and every trade contractor and subcontractor will be required to attend a Pre-Construction Meeting and Project Kick-Off Meeting. New construction personnel that are unable to attend are required to attend a brief safety meeting that will include a construction waste training session before being allowed to work on the site. Further, the Demolition Debris Management Plan will be on the agenda at regular construction meetings to update the project team on the status of [Prime Contractor Name] goals for diverted waste and what measures may need to be implemented if these goals are not being met.

**SITE ASSESSMENT- DISPOSAL & HANDLING**

Contractor to provide dumpsters for processing recyclables and waste; Examples are: 1) Concrete materials; 2) Metal; 3) mixed waste All of these to be sorted at landfill site or recycling facility.

Upon approval, [Prime Contractor Name] will use the VA-provided cardboard dumpster for all cardboard materials.

The following table lists expected wastes on this project, their disposal method, and handling procedures:

**Hauler:**

[Company Name, Contact, Address]

**Recycling:**

[Company Name, Contact, Address]

Item	Disposal method	Handling Procedure	Destination/Recipient
Masonry	Recycle	Place in concrete dumpster	ACME WASTE, INC.
Concrete	Recycle	Place in concrete dumpster	ACME WASTE, INC.
Scrap Metals	Recycle	Place in Metal dumpster	ACME WASTE, INC.
Cardboard	Recycle or reuse	Minimal packaging where possible, or place in cardboard dumpster	VA-provided cardboard dumpster (permission required)
Drywall	Recycle	Place in mixed dumpster	ACME WASTE, INC.
Wood (clean)	Recycle	Place in mixed dumpster	ACME WASTE, INC.

Attachment A - Sample Construction Waste Management Plan

Plumbing Fixtures	Recycle	Place in mixed dumpster	ACME WASTE, INC.
Glass	Recycle	Place in mixed dumpster	ACME WASTE, INC.
Plastics (noncontaminated)	Recycle	Place in mixed dumpster	ACME WASTE, INC.
Plastics (contaminated)	Landfill	Place in mixed dumpster	ACME WASTE, INC.
Ceiling Tile	Recycle	Place in mixed dumpster	ACME WASTE, INC.
Wiring	Recycle/Salvage	Electrician will reuse or recycle	[Trade Subcontractor Name]
Light Fixtures	Recycle/Salvage	Electrician will reuse, salvage, or recycle	[Trade Subcontractor Name]
Lamps (Universal Waste)	Recycle/Salvage	Electrician will reuse, salvage, or recycle	[Trade Subcontractor Name]
Ballasts	Recycle/Salvage	Electrician will reuse, salvage, or recycle	[Trade Subcontractor Name]
Carpet	Recycle	Carpet Subcontractor place in mixed dumpster or recycle	[Company Name]
Inerts	Recycle	Place in Concrete Dumpster	[Company Name]
Soil	Reuse	Reuse throughout project	[Contractor Name]
All Other Wastes	Landfill	Reduce waste where possible, research recycling or reuse opportunities	[Company Name]

**Waste Auditing.**

All subcontractors are responsible for daily site cleanup and ensuring that all recycling containers are kept free of contamination. **[Prime Contractor Name]** representatives shall be responsible for daily checks of trash and recycling containers to check for and ensure the removal of contamination. Violators will be required to re-sort any misplaced waste and, if the problem continues, pay the cost of **[Prime Contractor Name]** time to sort recyclables from the trash. **[Prime Contractor Name]** representatives shall be responsible for contacting haulers for collection service.

**Documentation.**

Documentation of the waste management plan will consist of the following:

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

Attachment A - Sample Construction Waste Management Plan

1. Records will be provided in accordance with LEED Reference Guide and LEED Template.
2. Records will include the amount of material salvaged, recycled and re-used.
3. Records will include a list of materials taken to the landfill.
4. Material tracking data shall be provided indicating receiving parties, dates, weight tickets, tipping fees, manifests and the total resulting cost or savings.

The quantities in the report will be updated by **[Prime Contractor Name]** based on information provided by each Trade Contractor and the independent hauler under contract to provide the metal dumpsters. Each Trade Contractor shall be responsible for providing the following documentation for any waste generated on site that is not deposited in the dumpsters provided by **[Prime Contractor Name]**.

1. A record of the type and quantity (by weight) of each material salvaged, reused, recycled, or disposed in a manner other than that provided by **[Prime Contractor Name]** through their independent hauler.
2. Disposal receipts: Provide copies of all receipts issued by a disposal facility for CDL waste that is disposed in a landfill.
3. Recycling Receipts: Provide copies of all receipts issued by an approved recycling facility.
4. Salvaged materials document: types and quantities (by weight) for materials salvaged for reuse on site, sold, or donated to a third party.

This documentation will then be compiled by **[Prime Contractor Name]** in monthly waste tracking reports.

**SECTION 01 81 11**  
**SUSTAINABLE DESIGN REQUIREMENTS**

**PART 1 - GENERAL**

**1.1 SUMMARY**

This Section describes general requirements and procedures to comply with the Guiding Principles for Leadership in High Performance and Sustainable Buildings Memorandum of Understanding incorporated in the Executive Orders 13423 and 13514; Energy Policy Act of 2005 (EPA 2005) and the Energy Independence and Security Act of 2007 (EISA 2007).

**1.2 OBJECTIVES**

- A. To maximize resource efficiency and reduce the environmental impacts of construction and operation, the Contractor during the construction phase of this project shall implement the following procedures:
1. Select products that minimize consumption of energy, water and non-renewable resources, while minimizing the amounts of pollution resulting from the production and employment of building technologies. It is the intent of this project to conform with EPA's Five Guiding Principles on environmentally preferable purchasing. The five principles are:
    - a. Include environmental considerations as part of the normal purchasing process.
    - b. Emphasize pollution prevention early in the purchasing process.
    - c. Examine multiple environmental attributes throughout a product's or service's life cycle.
    - d. Compare relevant environmental impacts when selecting products and services.
    - e. Collect and base purchasing decisions on accurate and meaningful information about environmental performance.
  2. Control sources for potential Indoor Air Quality (IAQ) pollutants by controlled selection of materials and processes used in project construction in order to attain superior IAQ.
  3. Products and processes that achieve the above objectives to the extent currently possible and practical have been selected and included in these Construction Documents. The Contractor is responsible to maintain and support these objectives in developing means and methods for performing the work of this Contract and in

proposing product substitutions and/or changes to specified processes.

4. Use building practices that insure construction debris and particulates do not contaminate or enter duct work prior to system startup and turn over.

### **1.3 RELATED DOCUMENTS**

- A. Section 01 74 19 CONSTRUCTION WASTE MANAGEMENT

### **1.4 DEFINITIONS**

- A. Agrifiber Products: Composite panel products derived from agricultural fiber
- B. Biobased Product: As defined in the 2002 Farm Bill, a product determined by the Secretary to be a commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials
- C. Biobased Content: The weight of the biobased material divided by the total weight of the product and expressed as a percentage by weight
- D. Certificates of Chain-of-Custody: Certificates signed by manufacturers certifying that wood used to make products has been tracked through its extraction and fabrication to ensure that it was obtained from forests certified by a specified certification program
- E. Composite Wood: A product consisting of wood fiber or other plant particles bonded together by a resin or binder
- F. Construction and Demolition Waste: Includes solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair and demolition operations. A construction waste management plan is to be provided by the Contractor as defined in Section 01 74 19.
- G. Third Party Certification: Certification of levels of environmental achievement by nationally recognized sustainability rating system.
- H. Light Pollution: Light that extends beyond its source such that the additional light is wasted in an unwanted area or in an area where it inhibits view of the night sky
- I. Recycled Content Materials: Products that contain pre-consumer or post-consumer materials as all or part of their feedstock

- J. Post-Consumer Recycled Content: The percentage by weight of constituent materials that have been recovered or otherwise diverted from the solid-waste stream after consumer use
- K. Pre-Consumer Recycled Content: Materials that have been recovered or otherwise diverted from the solid-waste stream during the manufacturing process. Pre-consumer content must be material that would not have otherwise entered the waste stream as per Section 5 of the FTC Act, Part 260 "Guidelines for the Use of Environmental Marketing Claims": [www.ftc.gov/bcp/grnrule/guides980427](http://www.ftc.gov/bcp/grnrule/guides980427)
- L. Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 250 miles (400 km) from the Project site
- M. Salvaged or Reused Materials: Materials extracted from existing buildings in order to be reused in other buildings without being manufactured
- N. Sealant: Any material that fills and seals gaps between other materials
- O. Type 1 Finishes: Materials and finishes which have a potential for short-term levels of off gassing from chemicals inherent in their manufacturing process, or which are applied in a form requiring vehicles or carriers for spreading which release a high level of particulate matter in the process of installation and/or curing.
- P. Type 2 Finishes: "Fuzzy" materials and finishes which are woven, fibrous, or porous in nature and tend to adsorb chemicals offgas
- Q. Volatile Organic Compounds (VOCs): Any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Compounds that have negligible photochemical reactivity, listed in EPA 40 CFR 51.100(s), are also excluded from this regulatory definition.

#### **1.5 SUBMITTALS**

- A. Sustainable Design Submittals:
  - 1. Salvaged or Reused Materials: Provide documentation that lists each salvaged or reused material, the source or vendor of the material, the purchase price, and the replacement cost if greater than the purchase price.
  - 2. Recycled Content: Submittals for all materials with recycled content (excluding MEP systems equipment and components) must include the

- following documentation: Manufacturer's product data, product literature, or a letter from the manufacturer verifying the percentage of post-consumer and pre-consumer recycled content (by weight) of each material or product
- a. An electronic spreadsheet that tabulates the Project's total materials cost and combined recycled content value (defined as the sum of the post-consumer recycled content value plus one-half of the pre-consumer recycled content value) expressed as a percentage of total materials cost. This spreadsheet shall be submitted every third month with the Contractor's Certificate and Application for Payment. It should indicate, on an ongoing basis, line items for each material, including cost, pre-consumer recycled content, post-consumer recycled content, and combined recycled content value.
3. Regional Materials: Submittals for all products or materials expected to contribute to the regional calculation (excluding MEP systems equipment and components) must include the following documentation:
- a. Cost of each material or product, excluding cost of labor and equipment for installation
  - b. Location of product manufacture and distance from point of manufacture to the Project Site
  - c. Location of point of extraction, harvest, or recovery for each raw material in each product and distance from the point of extraction, harvest, or recovery to the Project Site
  - d. Manufacturer's product data, product literature, or a letter from the manufacturer verifying the location and distance from the Project Site to the point of manufacture for each regional material
  - e. Manufacturer's product data, product literature, or a letter from the manufacturer verifying the location and distance from the Project Site to the point of extraction, harvest, or recovery for each regional material or product, including, at a minimum, gravel and fill, planting materials, concrete, masonry, and GWB
  - f. An electronic spreadsheet that tabulates the Project's total materials cost and regional materials value, expressed as a percentage of total materials cost. This spreadsheet shall be

submitted every third month with the Contractor's Certificate and Application for Payment. It should indicate on an ongoing basis, line items for each material, including cost, location of manufacture, distance from manufacturing plant to the Project Site, location of raw material extraction, and distance from extraction point to the Project Site.

4. Exterior Paints and Coatings: Submittals for all field-applied paints and coatings, which have a potential impact on ambient air quality, must include manufacturer's MSDSs or other manufacturer's Product Data highlighting VOC content.
- B. Project Materials Cost Data: Provide a spreadsheet in an electronic file indicating the total cost for the Project and the total cost of building materials used for the Project, as follows:
  1. Not more than 60 days after the Preconstruction Meeting, the General Contractor shall provide to the Owner and Architect a preliminary schedule of materials costs for all materials used for the Project organized by specification section. Exclude labor costs and all mechanical, electrical, and plumbing (MEP) systems materials and labor costs. Include the following:
    - a. Identify each reused or salvaged material, its cost, and its replacement value.
    - b. Identify each recycled-content material, its post-consumer and pre-consumer recycled content as a percentage the product's weight, its cost, its combined recycled content value (defined as the sum of the post-consumer recycled content value plus one-half of the pre-consumer recycled content value), and the total combined recycled content value for all materials as a percentage of total materials costs.
    - c. Identify each regional material, its cost, its manufacturing location, the distance of this location from the Project site, the source location for each raw material component of the material, the distance of these extraction locations from the Project site, and the total value of regional materials as a percentage of total materials costs.
    - d. Identify each biobased material, its source, its cost, and the total value of biobased materials as a percentage of total materials costs. Also provide the total value of rapidly

renewable materials (materials made from plants that are harvested in less than a 10-year cycle) as a percentage of total materials costs.

- e. Identify each wood-based material, its cost, the total wood-based materials cost, each FSC Certified wood material, its cost, and the total value of Certified wood as a percentage of total wood-based materials costs.

- 2. Provide final versions of the above spreadsheets to the Owner and Architect not more than 14 days after Substantial Completion.

C. Construction Waste Management: See Section 01 74 19 "Construction Waste Management" for submittal requirements.

D. Sustainable Design Progress Reports: Concurrent with each Application for Payment, submit reports for the following:

- 1. Construction Waste Management: Waste reduction progress reports and logs complying with the requirements of Section 01 74 19 "Construction Waste Management."

## **1.6 QUALITY ASSURANCE**

A. Preconstruction Meeting: After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner, Architect, and all Subcontractors to discuss the Construction Waste Management Plan, the required Construction Indoor Air Quality (IAQ) Management Plan, and all other Sustainable Design Requirements. The purpose of this meeting is to develop a mutual understanding of the Project's Sustainable Design Requirements and coordination of the Contractor's management of these requirements with the Contracting Officer and the Construction Quality Manager.

B. Construction Job Conferences: The status of compliance with the Sustainable Design Requirements of these specifications will be an agenda item at all regular job meetings conducted during the course of work at the site.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT ENVIRONMENTAL REQUIREMENTS**

- A. Do not burn rubbish, organic matter, etc. or any material on the site. Dispose of legally in accordance with Specifications Sections 01 74 19.
- B. Herbicides and Pest Control: Herbicides shall not be permitted, and pest control measures shall utilize EPA-registered biopesticides only.

06-01-12

C. Salvaged or Reused materials: There shall be no substitutions for specified salvaged and reused materials and products.

1. Salvaged materials: Use of salvaged materials reduces impacts of disposal and manufacturing of replacements.

D. Recycled Content of Materials:

1. Provide building materials with recycled content such that post-consumer recycled content value plus half the pre-consumer recycled content value constitutes a minimum of 30% of the cost of materials used for the Project, exclusive of all MEP equipment, labor, and delivery costs. The Contractor shall make all attempts to maximize the procurement of materials with recycled content.

- a. e post-consumer recycled content value of a material shall be determined by dividing the weight of post-consumer recycled content by the total weight of the material and multiplying by the cost of the material.
- b. Do not include mechanical and electrical components in the calculations.
- c. Do not include labor and delivery costs in the calculations.
- d. Recycled content of materials shall be defined according to the Federal Trade Commission's "Guide for the Use of Environmental Marketing Claims," 16 CFR 260.7 (e).

E. Biobased Content:

1. For products designated by the USDA's BioPreferred program, provide products that meet or exceed USDA recommendations for biobased content, so long as products meet all other performance requirements in VA master specifications. For more information regarding the product categories covered by the BioPreferred program, visit <http://www.biopreferred.gov>

- - - E N D - - -

**SECTION 02 42 00**  
**CUTTING, REMOVAL, DEMOLITION, RESTORATION AND PATCHING**

**PART 1 GENERAL**

**1.1 SCOPE:**

- A. Refer to SECTION 01 00 00 for special requirements, protection, constraints, timing of work, scheduling of work, enclosures and similar requirements relating to this section.
- B. This section covers cutting, demolition, removal work, patching, leveling and restoration work as necessary to accomplish and complete all work under this contract, including any relocation or reuse of existing materials, equipment, systems, or other work, as well as the disposition of salvaged materials or debris.  
This Section applies to all work under this contract, including general construction, mechanical and electrical work.
- C. Contractor and his subcontractors shall examine the spaces/work site themselves to determine the actual conditions and requirements. All removals, demolition, cutting, restoration, new installations and other work shall be accomplished to transform the existing spaces and conditions to the new conditions required under the Contract, as well as to accomplish all tie-in work of new to existing.
- D. It is the intent that, unless specifically shown on the schedules, or is inherent in the work to be accomplished under the general construction work of the area, that each contractor shall perform the demolition, cutting, removals, relocations, patching and leveling, and restoration as will be required to accomplish the work under their contracts. All work indicated on the schedules shall be accomplished by the General Contractor.
- E. Except for general demolition of entire areas, it is the intent that at each area or space the contractor and each subcontractor shall make removals, perform cutting or demolition and accomplish relocations of work normal to his trade (i.e., Mechanical Contractor removes or relocates piping, ductwork and similar. At areas of general demolition of entire area spaces, the Mechanical Contractor shall make removals normal to their trade or may be

called for, for reuse or relocation, make any relocations and cutoffs, terminate, or otherwise discontinue services that will be abandoned, shall be removed to the nearest active main. The general contractor shall then demolish or remove all unwanted electrical or mechanical materials, items or elements in the area.

- F. Contractor is required to restore all finishes, surfaces, items, & materials as required to accommodate new finishes. For example, if wall paper, vinyl wall covering, ceramic wall tile, etc. is existing on wall, and new wall finish calls for wall to be painted, contractor is required to remove existing wall paper, vinyl wall covering, ceramic wall tile, etc. to accommodate new painted finish. These surfaces are required to be verified prior to bid, as no change to contract will be provided after award if existing finishes are clearly present.

## **PART 2: MATERIALS**

### **2.1 SALVAGEABLE MATERIALS TO BE STORED BY OWNER (VA) :**

- A. The owner shall mark or tag existing materials, equipment or other items that are to be retained during a pre-demolition walk through. Salvageable materials and items designated or marked to remain the property of the government shall be carefully removed by applicable trades, protected from damage and stored adjacent to the removal area as directed.
- B. Consult the Project Manager concerning any possible salvageable items prior to demolition thereof. Carefully remove and salvage any materials designated to be retained.
- C. Any materials not wanted by the government shall be removed from the site by the contractor, without additional cost to the government.
- D. Removal from the area and the site to the government's storage area shall be by the contractor.

## **PART 3 EXECUTION:**

### **3.1 TEMPORARY PROTECTION:**

- A. Provide temporary bracing, shoring, needling and support during demolition, cutting, remodeling and related new construction

necessary for the execution of the work and the protection of persons and property. Perform all work with appropriate supports, protection and methods to prevent collapse, settling or damage to property or persons. Provide adequate supports for the loads to be carried, with loads properly distributed, and including to lower levels and sound bearing, if necessary.

- B Provide protective covering and enclosures necessary to prevent damage to existing spaces and materials to remain.
- C. Provide dust proof temporary enclosures (including above ceilings) separating areas under demolition and remodeling from the remainder of the buildings as well as temporary filters at ductwork. If work produces fumes or odors that impact patient care or staff operations, granulated active carbon filters shall be provided for all HVAC intake units where operations provide these odors or fumes. Provide temporary hinged doors in temporary enclosures where necessary. Temporary and permanent doors shall be completely sealed with tape or other suitable material during demolition work and shall remain sealed until dust has settled.

### **3.2 MECHANICAL AND ELECTRICAL WORK EXPOSED - NOT APPLICABLE**

### **3.3 WORK OF EACH CONTRACT**

- A. The contractor and each subcontractor shall carefully review the contract documents, including those primarily for other trades, with respect to the coordination of demolition, removal and remodeling work and perform such removals normal to their respective trade as may be shown, noted, or otherwise required. Cutting and patching incidental to demolition, removal and/or remodeling of general construction work shall be construed as the work of the general contractor when shown or indicated on the general construction drawings or schedules or specifically noted or called for on documents primarily for other trades as being accomplished by the general contractor. Other contractors shall perform such other cutting, demolition, patching, replacement and restoration as may be required to accomplish their part of the work.

**3.4 PAINTING**

- A. Any painting to match adjacent or surrounding areas.

**3.5 LEVELING OF FLOORS - NOT APPLICABLE**

**3.6 PATCHING**

- A. Contractor shall be responsible for all patching required as a result of installation of new work.
- B. Contractor shall furnish all related components, trims, etc. required to complete the work.

- - -END- - -

**SECTION 02 83 33.13**  
**LEAD-BASED PAINT REMOVAL AND DISPOSAL**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies abatement and disposal of lead-based paint (LBP) and controls needed to limit occupational and environmental exposure to lead hazards.

**1.2 RELATED WORK**

- A. Section 02 42 00, CUTTING, REMOVAL, DEMOLITION, RESTORATION & PATCHING.
- B. Section 09 91 00, PAINTING.

**1.3 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. Code of Federal Regulations (CFR):
  - CFR 29 Part 1910.....Occupational Safety and Health Standards
  - CFR 29 Part 1926.....Safety and Health Regulations for Construction
  - CFR 40 Part 148.....Hazardous Waste Injection Restrictions
  - CFR 40 Part 260.....Hazardous Waste Management System: General
  - CFR 40 Part 261.....Identification and Listing of Hazardous Waste
  - CFR 40 Part 262.....Standards Applicable to Generators of Hazardous Waste
  - CFR 40 Part 263.....Standards Applicable to Transporters of Hazardous Waste
  - CFR 40 Part 264.....Standards for Owners and Operations of Hazardous Waste Treatment, Storage, and Disposal Facilities
  - CFR 40 Part 265.....Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
  - CFR 40 Part 268.....Land Disposal Restrictions
  - CFR 49 Part 172.....Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements
  - CFR 49 Part 178.....Specifications for Packaging
- C. National Fire Protection Association (NFPA):
  - NFPA 701-2004.....Methods of Fire Test for Flame-Resistant Textiles and Films
- D. National Institute for Occupational Safety And Health (NIOSH)

- |                                   |  |
|-----------------------------------|--|
| UL 586-1996 (Rev 2009)..<br>Units | High-Efficiency, Particulate, Air Filter |
|-----------------------------------|--|

- Z9.2-2006.....Fundamentals Governing the Design and Operation  
of Local Exhaust Systems

- Z88.6-2006.....Respiratory Protection

- A. **Action Level:** Employee exposure, without regard to use of respirations, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period. As used in this section, "30 micrograms per cubic meter of air" refers to the action level.
- B. **Area Monitoring:** Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations which may reach the breathing zone of personnel potentially exposed to lead.
- C. **Physical Boundary:** Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area."
- D. **Certified Industrial Hygienist (CIH):** As used in this section, refers to an Industrial Hygienist employed by the Contractor and is certified by the American Board of Industrial Hygiene in comprehensive practice.
- E. **Change Rooms and Shower Facilities:** Rooms within the designated physical boundary around the lead control area equipped with separate storage facilities for clean protective work clothing and equipment and for street clothes which prevent cross- contamination.
- F. **Competent Person:** A person capable of identifying lead hazards in the work area and is authorized by the contractor to take corrective action.
- G. **Decontamination Room:** Room for removal of contaminated personal protective equipment (PPE).
- H. **Eight-Hour Time Weighted Average (TWA):** Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.
- I. **High Efficiency Particulate Air (HEPA) Filter Equipment:** HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

- J. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.
- K. Lead Control Area: An enclosed area or structure with full containment to prevent the spread of lead dust, paint chips, or debris of lead-containing paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.
- L. Lead Permissible Exposure Limit (PEL): Fifty micrograms per cubic meter of air as an 8-hour time weighted average as determined by 29 CFR 1910.1025. If an employee is exposed for more than 8 hours in a work day, the PEL shall be determined by the following formula. 
$$\text{PEL (micrograms/cubic meter of air)} = 400 / \text{No. of hrs worked per day}$$
- M. Personnel Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1910.1025. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 150 mm to 225 mm (6 to 9 inches) and the center at the nose or mouth of an employee.

#### **1.5 QUALITY ASSURANCE**

- A. Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1926.62 (I) (1) (i) & (ii). The examination shall not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62(I) without the last year.
- B. Medical Records: Maintain complete and accurate medical records of employees in accordance with 29 CFR 1910.20.
- C. CIH Responsibilities: The Contractor shall employ a certified Industrial Hygienist who will be responsible for the following:
  - 1. Certify Training.
  - 2. Review and approve lead-containing paint removal plan for conformance to the applicable referenced standards.
  - 3. Inspect lead-containing paint removal work for conformance with the approved plan.
  - 4. Direct monitoring.
  - 5. Ensure work is performed in strict accordance with specifications at all times.
  - 6. Ensure hazardous exposure to personnel and to the environment are adequately controlled at all times.

- D. Training: Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment, in accordance with 29 CFR 1926.62.
- E. Training Certification: Submit certificates signed and dated by the CIH and by each employee stating that the employee has received training.
- F. Respiratory Protection Program:
  - 1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 6 months thereafter as required by 29 CFR 1926.62.
  - 2. Establish and implement a respiratory protection program as required by 29 CFR 1910.134, 29 CFR 1910.1025, and 29 CFR 1926.62.
- G. Hazard Communication Program: Establish and implement a Hazard Communication Program as required by 29 CFR 1910.1200.
- H. Hazardous Waste Management: The Hazardous Waste Management plan shall comply with applicable requirements of Federal, State, and local hazardous waste regulations and address:
  - 1. Identification of hazardous wastes associated with the work.
  - 2. Estimated quantities of wastes to be generated and disposed of.
  - 3. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA hazardous waste permits and EPA Identification numbers.
  - 4. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
  - 5. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
  - 6. Spill prevention, containment, and cleanup contingency measures to be implemented.
  - 7. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
  - 8. Cost for hazardous waste disposal according to this plan.
- I. Safety and Health Compliance:
  - 1. In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of 29 CFR 1910.1025. Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work.

2. Where specification requirements and the referenced documents vary, the most stringent requirements shall apply.

J. Pre-Construction Conference: Along with the CIH, meet with the Contracting Officer to discuss in detail the lead-containing paint removal work plan, including work procedures and precautions for the work plan.

#### **1.6 SUBMITTALS**

A. Submit the following in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Catalog Data:

Vacuum filters

Respirators

C. Instructions: Paint removal materials. Include applicable material safety data sheets.

D. Statements Certifications and Statements:

1. Qualifications of CIH: Submit name, address, and telephone number of the CIH selected to perform responsibilities in paragraph entitled "CIH Responsibilities." Provide previous experience of the CIH.

Submit proper documentation that the Industrial Hygienist is certified by the American Board of Industrial Hygiene in comprehensive practice, including certification number and date of certification/recertification.

2. Testing Laboratory: Submit the name, address, and telephone number of the testing laboratory selected to perform the monitoring, testing, and reporting of airborne concentrations of lead. Provide proper documentation that persons performing the analysis have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program. The laboratory shall be accredited by the American Industrial Hygiene Association (AIHA). Provide AIHA documentation along with date of accreditation/reaccreditation.

3. Lead-Containing Paint Removal Plan:

a. Submit a detailed job-specific plan of the work procedures to be used in the removal of lead-containing paint. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination rooms, change rooms, shower facilities, and mechanical ventilation system.

- b. Include in the plan, eating, drinking, smoking and restroom procedures, interface of trades, sequencing of lead related work, collected wastewater and paint debris disposal plan, air sampling plan, respirators, protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded outside of the lead control area.
  - c. Include air sampling, training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of air monitoring personnel in the air sampling portion on the plan.
- 4. Field Test Reports: Monitoring Results: Submit monitoring results to the Contracting Officer within 3 working days, signed by the testing laboratory employee performing the air monitoring, the employee that analyzed the sample, and the CIH.
- 5. Records:
  - a. Completed and signed hazardous waste manifest from treatment or disposal facility.
  - b. Certification of Medical Examinations.
  - c. Employee training certification.

## **PART 2 PRODUCTS**

PAINT REMOVAL PRODUCTS: Submit applicable Material Safety Data Sheets for paint removal products used in paint removal work. Use the least toxic product, suitable for the job and acceptable to the Industrial Hygienist.

## **PART 3 EXECUTION**

### **3.1 PROTECTION**

- A. Notification: Notify the Contracting Officer 20 days prior to the start of any paint removal work.
- B. Lead Control Area Requirements.
  - 1. Establish a lead control area by completely enclosing with containment screens the area or structure where lead-containing paint removal operations will be performed.
  - 2. Contain removal operations by the use of a negative pressure full containment system with at least one change room and with HEPA filtered exhaust.
- C. Protection of Existing Work to Remain: Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition.

- D. Boundary Requirements: Provide physical boundaries around the lead control area by roping off the area [designated on the drawings] or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.
- E. Heating, Ventilating and Air Conditioning (HVAC) Systems: Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6-mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.
- F. Change Room and Shower Facilities: Provide clean change rooms and shower facilities within the physical boundary around the designated lead control area in accordance with requirements of 29 CFR 1926.62.
- G. Mechanical Ventilation System:
  - 1. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.57.
  - 2. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the industrial hygienist. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with ANSI Z9.2.
  - 3. If air from exhaust ventilation is recirculated into the work place, the system shall have a high efficiency filter with reliable back-up filter and controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails. Air may be recirculated only where exhaust to the outside is not feasible.
- H. Personnel Protection: Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been given appropriate training and protective equipment.
- I. Warning Signs: Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of 29 CFR 1926.62.

### **3.2 WORK PROCEDURES**

- A. Perform removal of lead-containing paint in accordance with approved lead-containing paint removal plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when

lead- containing paint is removed in accordance with 29 CFR 1926.62, except as specified herein. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), federal, state, and local requirements.

B. Personnel Exiting Procedures:

1. Whenever personnel exist the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:
  - a. Vacuum themselves off.
  - b. Remove protective clothing in the decontamination room, and place them in an approved impermeable disposal bag.
  - c. Shower.
  - d. Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated job site.

C. Monitoring: Monitoring of airborne concentrations of lead shall be in accordance with 29 CFR 1910.1025 and as specified herein. Air monitoring, testing, and reporting shall be performed by a CIH or an Industrial Hygiene (IH) Technician who is under the direction of the CIH:

1. The CIH or the IH Technician under the direction of the CIH shall be on the job site directing the monitoring, and inspecting the lead-containing paint removal work to ensure that the requirements of the Contract have been satisfied during the entire lead-containing paint removal operation.
2. Take personal air monitoring samples on employees who are anticipated to have the greatest risk of exposure as determined by the CIH. In addition, take air monitoring samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
3. Submit results of air monitoring samples, signed by the CIH, within 24 hours after the air samples are taken. Notify the Contracting Officer immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.

D. Monitoring During Paint Removal Work:

1. Perform personal and area monitoring during the entire paint removal operation. Sufficient area monitoring shall be conducted at the physical boundary to ensure unprotected personnel are not exposed above 30 micrograms per cubic meter of air at all times. If the outside boundary lead levels are at or exceed 30 micrograms per cubic

- meter of air, work shall be stopped and the CIH shall immediately correct the condition(s) causing the increased levels and notify the Contracting Officer immediately.
2. The CIH shall review the sampling data collected on that day to determine if condition(s) requires any further change in work methods. Removal work shall resume when approval is given by the CIH. The Contractor shall control the lead level outside of the work boundary to less than 30 micrograms per cubic meter of air at all times. As a minimum, conduct area monitoring daily on each shift in which lead paint removal operations are performed in areas immediately adjacent to the lead control area.
  3. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area. If adjacent areas are contaminated, clean and visually inspect contaminated areas. The CIH shall certify that the area has been cleaned of lead contamination.

### **3.3 LEAD-CONTAINING PAINT REMOVAL**

- A. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions are necessary to ensure that there is no damage to the underlying substrate.
- B. Indoor Lead Paint Removal: Select paint removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-containing paint removal plan. Perform manual sanding and scraping to the maximum extent feasible.
- C. Mechanical Paint Removal and Blast Cleaning: Blast cleaning of any kind is prohibited except at metal components of the building. Adjacent surfaces must be protected to ensure that no damage occurs from blast cleaning of metal components. Perform mechanical paint removal and blast cleaning in lead control areas using negative pressure full containments with HEPA filtered exhaust. Collect paint residue and spent grit (used abrasive) from blasting operations for disposal in accordance with EPA, state and local requirements.
- D. Outside Lead Paint Removal: Select removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-containing paint removal plan. Perform manual sanding and scraping to the maximum extent feasible.

### **3.4 SURFACE PREPARATIONS**

Avoid flash rusting or other deterioration of the substrate. Provide surface preparations for painting in accordance with Section 09 91 00, PAINTING.

### **3.5 CLEANUP AND DISPOSAL**

- A. Cleanup: Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet mopping the area.
- B. Certification: The CIH shall certify in writing that the inside and outside the lead control area air monitoring samples are less than 30 micrograms per cubic meter of air, the respiratory protection for the employees was adequate, the work procedures were performed in accordance with 29 CFR 1926.62, and that there were no visible accumulations of lead-contaminated paint and dust on the worksite. Do not remove the lead control area or roped-off boundary and warning signs prior to the Contracting Officer's receipt of the CIH's certification. Reclean areas showing dust or residual paint chips.
- C. Testing of Lead-Containing Paint Residue and Used Abrasive Where indicated or when directed by the Contracting Officer, test lead containing paint residue and used abrasive in accordance with 40 CFR 261 for hazardous waste.
- D. Disposal:
  - 1. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles.
  - 2. Store removed paint, lead-contaminated clothing and equipment, and lead-contaminated dust and cleaning debris into U.S. Department of Transportation (49 CFR 178) approved 55-gallon drums. Properly labels each drum to identify the type of waste (49 CFR 172) and the date lead-contaminated wastes were first put into the drum. Obtain and complete the Uniform Hazardous Waste Manifest forms from [Activity Staff Civil Engineer located at VA GEMS Coordinator. Comply with land disposal restriction notification requirements as required by 40 CFR 268:

- a. At least 14 days prior to delivery, notify the Contracting Officer who will arrange for job site inspection of the drums and manifests by VA GEMS Coordinator.
  - b. As necessary, make lot deliveries of hazardous wastes to the VA GEMS Coordinator to ensure that drums do not remain on the jobsite longer than 90 calendar days from the date affixed to each drum.
  - c. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing which may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62. Dispose of lead-contaminated waste material at a EPA approved hazardous waste treatment, storage, or disposal facility off Government property.
  - d. Store waste materials in U.S. Department of Transportation (49 CFR 178) approved 55-gallon drums. Properly label each drum to identify the type of waste (49 CFR 172) and the date the drum was filled. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.
  - e. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.
- E. Disposal Documentation Submit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and state or local regulatory agencies. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.

- - - E N D - - -

10-01-12

**SECTION 03 30 00**  
**CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

This section specifies cast-in-place structural concrete and materials and mixes for other concrete.

**1.2 RELATED WORK:**

- A. Concrete walks, and similar exterior site work: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.

**1.3 TESTING AGENCY FOR CONCRETE MIX DESIGN:**

- A. Testing agency for the trial concrete mix design retained and reimbursed by the Contractor and approved by COR. For all other testing, refer to Section 01 45 29 Testing Laboratory Services.
- B. Testing agency maintaining active participation in Program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology. Accompany request for approval of testing agency with a copy of Report of Latest Inspection of Laboratory Facilities by CCRL.
- C. Testing agency shall furnish equipment and qualified technicians to establish proportions of ingredients for concrete mixes.

**1.4 TOLERANCES:**

- A. Formwork: ACI 117, except the elevation tolerance of formed surfaces before removal of shores is +0 mm (+0 inch) and -20 mm (-3/4 inch).
- B. Reinforcement Fabricating and Placing: ACI 117, except that fabrication tolerance for bar sizes Nos. 10, 13, and 16 (Nos. 3, 4, and 5) (Tolerance Symbol 1 in Fig. 2.1(a), ACI, 117) used as column ties or stirrups is +0 mm (+0 inch) and -13 mm (-1/2 inch) where gross bar length is less than 3600 mm (12 feet), or +0 mm (+0 inch) and -20 mm (-3/4 inch) where gross bar length is 3600 mm (12 feet) or more.
- C. Cross-Sectional Dimension: ACI 117, except tolerance for thickness of slabs 12 inches or less is +20 mm (+3/4 inch) and - 6 mm (-1/4 inch). Tolerance of thickness of beams more than 300 mm (12 inch) but less than 900 mm (3 feet) is +20 mm (+3/4 inch) and -10 mm (-3/8 inch).
- D. Slab Finishes: ACI 117, Section 4.5.6, F-number method in accordance with ASTM E1155, except as follows:
  - 1. Test entire slab surface, including those areas within 600 mm (2 feet) of construction joints and vertical elements that project through slab surface.
  - 2. Maximum elevation change which may occur within 600 mm (2 feet) of any column or wall element is 6 mm (0.25 inches).

10-01-12

3. Allow sample measurement lines that are perpendicular to construction joints to extend past joint into previous placement no further than 1500 mm (5 feet).

**1.5 REGULATORY REQUIREMENTS:**

- A. ACI SP-66 - ACI Detailing Manual.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ACI 301 - Standard Specifications for Structural Concrete.

**1.6 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Shop Drawings: Reinforcing steel: Complete shop drawings
- C. Mill Test Reports:
  1. Reinforcing Steel.
  2. Cement.
- D. Manufacturer's Certificates:
  1. Abrasive aggregate.
  2. Lightweight aggregate for structural concrete.
  3. Air-entraining admixture.
  4. Chemical admixtures, including chloride ion content.
  5. Waterproof paper for curing concrete.
  6. Liquid membrane-forming compounds for curing concrete.
  7. Non-shrinking grout.
  8. Liquid hardener.
  9. Waterstops.
  10. Expansion joint filler.
  11. Adhesive binder.
- E. Testing Agency for Concrete Mix Design: Approval request including qualifications of principals and technicians and evidence of active participation in program of Cement and Concrete Reference Laboratory (CCRL) of National Institute of Standards and Technology and copy of report of latest CCRL, Inspection of Laboratory.
- F. Test Report for Concrete Mix Designs: Trial mixes including water-cement, concrete mix ingredients, and admixtures.
- G. Shoring and Reshoring Sequence: Submit for approval a shoring and reshoring sequence for flat slab/flat plate portions, prepared by a registered Professional Engineer. As a minimum, include timing of form stripping, reshoring, number of floors to be re-shored and timing of re-shore removal to serve as an initial outline of procedures subject to modification as construction progresses. Submit revisions to sequence, whether initiated by COR (see FORMWORK) or Contractor.

10-01-12

H. Test reports on splitting tensile strength (Fct) of lightweight concrete.

**1.7 DELIVERY, STORAGE, AND HANDLING:**

- A. Conform to ACI 304. Store aggregate separately for each kind or grade, to prevent segregation of sizes and avoid inclusion of dirt and other materials.
- B. Deliver other packaged materials for use in concrete in original sealed containers, plainly marked with manufacturer's name and brand, and protect from damage until used.

**1.8 PRE-CONCRETE CONFERENCE:**

- A. General: At least 15 days prior to submittal of design mixes, conduct a meeting to review proposed methods of concrete construction to achieve the required results.
- B. Agenda: Includes but is not limited to:
  - 1. Submittals.
  - 2. Coordination of work.
  - 3. Availability of material.
  - 4. Concrete mix design including admixtures.
  - 5. Methods of placing, finishing, and curing.
  - 6. Finish criteria required to obtain required flatness and levelness.
  - 7. Timing of floor finish measurements.
  - 8. Material inspection and testing.
- C. Attendees: Include but not limited to representatives of Contractor; subcontractors involved in supplying, conveying, placing, finishing, and curing concrete; lightweight aggregate manufacturer; admixture manufacturers; COR; Consulting Engineer; Department of Veterans Affairs retained testing laboratories for concrete testing and finish (F-number) verification.
- D. Minutes of the meeting: Contractor shall take minutes and type and distribute the minutes to attendees within five days of the meeting.

**1.9 MOCK-UP: - NOT APPLICABLE**

**1.10 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Concrete Institute (ACI):
  - 117-10.....Specifications for Tolerances for Concrete Construction and Materials and Commentary

10-01-12

- 211.1-91 (R2009) .....Standard Practice for Selecting Proportions for  
Normal, Heavyweight, and Mass Concrete
- 211.2-98 (R2004) .....Standard Practice for Selecting Proportions for  
Structural Lightweight Concrete
- 214R-11.....Guide to Evaluation of Strength Test Results of  
Concrete
- 301-10.....Standard Practice for Structural Concrete
- 304R-00 (R2009) .....Guide for Measuring, Mixing, Transporting, and  
Placing Concrete
- 305.1-06.....Specification for Hot Weather Concreting
- 306.1-90 (R2002) .....Standard Specification for Cold Weather  
Concreting
- 308.1-11.....Specification for Curing Concrete
- 309R-05.....Guide for Consolidation of Concrete
- 318-11.....Building Code Requirements for Structural  
Concrete and Commentary
- 347-04.....Guide to Formwork for Concrete
- SP-66-04.....ACI Detailing Manual
- C. American National Standards Institute and American Hardboard Association  
(ANSI/AHA):
  - A135.4-2004.....Basic Hardboard
- D. American Society for Testing and Materials (ASTM):
  - A82/A82M-07.....Standard Specification for Steel Wire, Plain,  
for Concrete Reinforcement
  - A185/185M-07.....Standard Specification for Steel Welded Wire  
Reinforcement, Plain, for Concrete
  - A615/A615M-09.....Standard Specification for Deformed and Plain  
Carbon Steel Bars for Concrete Reinforcement
  - A653/A653M-11.....Standard Specification for Steel Sheet, Zinc  
Coated (Galvanized) or Zinc Iron Alloy Coated  
(Galvannealed) by the Hot Dip Process
  - A706/A706M-09.....Standard Specification for Low Alloy Steel  
Deformed and Plain Bars for Concrete  
Reinforcement
  - A767/A767M-09.....Standard Specification for Zinc Coated  
(Galvanized) Steel Bars for Concrete  
Reinforcement
  - A775/A775M-07.....Standard Specification for Epoxy Coated  
Reinforcing Steel Bars

10-01-12

A820-11.....Standard Specification for Steel Fibers for  
Fiber Reinforced Concrete  
A996/A996M-09.....Standard Specification for Rail Steel and Axle  
Steel Deformed Bars for Concrete Reinforcement  
C31/C31M-10.....Standard Practice for Making and Curing Concrete  
Test Specimens in the field  
C33/C33M-11A.....Standard Specification for Concrete Aggregates  
C39/C39M-12.....Standard Test Method for Compressive Strength of  
Cylindrical Concrete Specimens  
C94/C94M-12.....Standard Specification for Ready Mixed Concrete  
C143/C143M-10.....Standard Test Method for Slump of Hydraulic  
Cement Concrete  
C150-11.....Standard Specification for Portland Cement  
C171-07.....Standard Specification for Sheet Materials for  
Curing Concrete  
C172-10.....Standard Practice for Sampling Freshly Mixed  
Concrete  
C173-10.....Standard Test Method for Air Content of Freshly  
Mixed Concrete by the Volumetric Method  
C192/C192M-07.....Standard Practice for Making and Curing Concrete  
Test Specimens in the Laboratory  
C231-10.....Standard Test Method for Air Content of Freshly  
Mixed Concrete by the Pressure Method  
C260-10.....Standard Specification for Air Entraining  
Admixtures for Concrete  
C309-11.....Standard Specification for Liquid Membrane  
Forming Compounds for Curing Concrete  
C330-09.....Standard Specification for Lightweight  
Aggregates for Structural Concrete  
C494/C494M-11.....Standard Specification for Chemical Admixtures  
for Concrete  
C618-12.....Standard Specification for Coal Fly Ash and Raw  
or Calcined Natural Pozzolan for Use in Concrete  
C666/C666M-03 (R2008) ....Standard Test Method for Resistance of Concrete  
to Rapid Freezing and Thawing  
C881/C881M-10.....Standard Specification for Epoxy Resin Base  
Bonding Systems for Concrete  
C1107/1107M-11.....Standard Specification for Packaged Dry,  
Hydraulic-Cement Grout (Non-shrink)

10-01-12

- C1315-11.....Standard Specification for Liquid Membrane  
Forming Compounds Having Special Properties for  
Curing and Sealing Concrete
- D6-95(R2011).....Standard Test Method for Loss on Heating of Oil  
and Asphaltic Compounds
- D297-93(R2006).....Standard Methods for Rubber Products Chemical  
Analysis
- D412-06AE2.....Standard Test Methods for Vulcanized Rubber and  
Thermoplastic Elastomers - Tension
- D1751-04(R2008).....Standard Specification for Preformed Expansion  
Joint Filler for Concrete Paving and Structural  
Construction (Non-extruding and Resilient  
Bituminous Types)
- D4263-83(2012).....Standard Test Method for Indicating Moisture in  
Concrete by the Plastic Sheet Method.
- D4397-10.....Standard Specification for Polyethylene Sheeting  
for Construction, Industrial and Agricultural  
Applications
- E1155-96(R2008).....Standard Test Method for Determining  $F_F$  Floor  
Flatness and  $F_L$  Floor Levelness Numbers
- F1869-11.....Standard Test Method for Measuring Moisture  
Vapor Emission Rate of Concrete Subfloor Using  
Anhydrous Calcium Chloride.
- E. American Welding Society (AWS):
- D1.4/D1.4M-11.....Structural Welding Code - Reinforcing Steel
- F. Concrete Reinforcing Steel Institute (CRSI):
- Handbook 2008
- G. National Cooperative Highway Research Program (NCHRP):
- Report On.....Concrete Sealers for the Protection of Bridge  
Structures
- H. U. S. Department of Commerce Product Standard (PS):
- PS 1.....Construction and Industrial Plywood
- PS 20.....American Softwood Lumber
- I. U. S. Army Corps of Engineers Handbook for Concrete and Cement:
- CRD C513.....Rubber Waterstops
- CRD C572.....Polyvinyl Chloride Waterstops

## **PART 2 - PRODUCTS:**

### **2.1 FORMS:**

- A. Wood: PS 20 free from loose knots and suitable to facilitate finishing  
concrete surface specified; tongue and grooved.

10-01-12

- B. Plywood: PS-1 Exterior Grade B-B (concrete-form) 16 mm (5/8 inch), or 20 mm (3/4 inch) thick for unlined contact form. B-B High Density Concrete Form Overlay optional.
- C. Metal for Concrete Rib-Type Construction: Steel (removal type) of suitable weight and form to provide required rigidity.
- D. Permanent Steel Form for Concrete Slabs: Corrugated, ASTM A653, Grade E, and Galvanized, ASTM A653, G90. Provide venting where insulating concrete fill is used.
- E. Corrugated Fiberboard Void Boxes: Double faced, completely impregnated with paraffin and laminated with moisture resistant adhesive, size as shown. Design forms to support not less than 48 KPa (1000 psf) and not lose more than 15 percent of their original strength after being completely submerged in water for 24 hours and then air dried.
- F. Form Lining:
  - 1. Hardboard: ANSI/AHA A135.4, Class 2 with one (S1S) smooth side)
  - 2. Plywood: Grade B-B Exterior (concrete-form) not less than 6 mm (1/4 inch) thick.
  - 3. Plastic, fiberglass, or elastomeric capable of reproducing the desired pattern or texture.
- G. Form Ties: Develop a minimum working strength of 13.35 kN (3000 pounds) when fully assembled. Ties shall be adjustable in length to permit tightening of forms and not have any lugs, cones, washers to act as spreader within form, nor leave a hole larger than 20 mm (3/4 inch) diameter, or a depression in exposed concrete surface, or leave metal closer than 40 mm (1 1/2 inches) to concrete surface. Wire ties not permitted. Cutting ties back from concrete face not permitted.

## **2.2 MATERIALS:**

- A. Portland Cement: ASTM C150 Type I or II.
- B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalies, and loss on ignition (LOI) not to exceed 5 percent.
- C. Coarse Aggregate: ASTM C33.
  - 1. Size 67 or Size 467 may be used for footings and walls over 300 mm (12 inches) thick.
  - 2. Coarse aggregate for applied topping, encasement of steel columns, and metal pan stair fill shall be Size 7.
  - 3. Maximum size of coarse aggregates not more than one-fifth of narrowest dimension between sides of forms, one-third of depth of slabs, nor three-fourth of minimum clear spacing between reinforcing bars.

10-01-12

- D. Lightweight Aggregates for Structural Concrete: ASTM C330, Table 1.  
Maximum size of aggregate not larger than one-fifth of narrowest dimension between forms, nor three-fourth of minimum clear distance between reinforcing bars. Contractor to furnish certified report to verify that aggregate is sound and durable, and has a durability factor of not less than 80 based on 300 cycles of freezing and thawing when tested in accordance with ASTM C666.
- E. Fine Aggregate: ASTM C33. Fine aggregate for applied concrete floor topping shall pass a 4.75 mm (No. 4) sieve, 10 percent maximum shall pass a 150  $\mu$ m (No. 100) sieve.
- F. Mixing Water: Fresh, clean, and potable.
- G. Admixtures:
1. Water Reducing Admixture: ASTM C494, Type A and not contain more chloride ions than are present in municipal drinking water.
  2. Water Reducing, Retarding Admixture: ASTM C494, Type D and not contain more chloride ions than are present in municipal drinking water.
  3. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
  4. Non-Corrosive, Non-Chloride Accelerator: ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. Admixture manufacturer must have long-term non-corrosive test data from an independent testing laboratory of at least one year duration using an acceptable accelerated corrosion test method such as that using electrical potential measures.
  5. Air Entraining Admixture: ASTM C260.
  6. Microsilica: Use only with prior review and acceptance of the COR. Use only in conjunction with high range water reducer.
  7. Calcium Nitrite corrosion inhibitor: ASTM C494 Type C.
  8. Prohibited Admixtures: Calcium chloride, thiocyanate or admixtures containing more than 0.05 percent chloride ions are not permitted.
  9. Certification: Written conformance to the requirements above and the chloride ion content of the admixture prior to mix design review.
- H. Vapor Barrier: ASTM D4397, 0.38 mm (15 mil).
- I. Reinforcing Steel: ASTM A615, or ASTM A996, deformed, grade as shown, epoxy coated.
- J. Welded Wire Fabric: ASTM A185.
- K. Reinforcing Bars to be Welded: ASTM A706.
- L. Galvanized Reinforcing Bars: ASTM A767.

10-01-12

- M. Epoxy Coated Reinforcing Bars: ASTM A775.
- N. Cold Drawn Steel Wire: ASTM A82.
- O. Reinforcement for Concrete Fireproofing: 100 mm x 100 mm x 3.4 mm diameter (4 x 4-W1.4 x W1.4) welded wire fabric, secured in place to hold mesh 20 mm (3/4 inch) away from steel. Mesh at steel columns shall be wired to No. 10 (No. 3) vertical corner steel bars.
- P. Reinforcement for Metal Pan Stair Fill: 50 mm (2 inch) wire mesh, either hexagonal mesh at .8Kg/m<sup>2</sup> (1.5 pounds per square yard), or square mesh at .6Kg/m<sup>2</sup> (1.17 pounds per square yard).
- Q. Supports, Spacers, and Chairs: Types which will hold reinforcement in position shown in accordance with requirements of ACI 318 except as specified.
- R. Expansion Joint Filler: ASTM D1751.
- S. Sheet Materials for Curing Concrete: ASTM C171.
- T. Liquid Membrane-forming Compounds for Curing Concrete: ASTM C309, Type I, with fugitive dye, and shall meet the requirements of ASTM C1315. Compound shall be compatible with scheduled surface treatment, such as paint and resilient tile, and shall not discolor concrete surface.
- U. Abrasive Aggregate: Aluminum oxide grains or emery grits.
- V. Non-Shrink Grout:
  - 1. ASTM C1107, pre-mixed, produce a compressive strength of at least 18 MPa at three days and 35 MPa (5000 psi) at 28 days. Furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent bearing under a 1200 mm x 1200 mm (4 foot by 4 foot) base plate.
  - 2. Where high fluidity or increased placing time is required, furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95 percent under an 450 mm x 900 mm (18 inch by 36 inch) base plate.
- W. Adhesive Binder: ASTM C881.
- X. Waterstops:
  - 1. Polyvinyl Chloride Waterstop: CRD C572.
  - 2. Rubber Waterstops: CRD C513.
  - 3. Bentonite Waterstop: Flexible strip of bentonite 25 mm x 20 mm (1 inch by 3/4 inch), weighing 8.7 kg/m (5.85 lbs. per foot) composed of Butyl Rubber Hydrocarbon (ASTM D297), Bentonite (SS-S-210-A) and Volatile Matter (ASTM D6).
  - 4. Non-Metallic Hydrophilic: Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water shall

10-01-12

- conform to ASTM D412 as follows: Tensile strength 420 psi minimum; ultimate elongation 600 percent minimum. Hardness shall be 50 minimum on the type A durometer and the volumetric expansion ratio in 70 deg water shall be 3 to 1 minimum.
- Y. Porous Backfill: Crushed stone or gravel graded from 25 mm to 20 mm (1 inch to 3/4 inch).
- Z. Fibers:
1. Synthetic Fibers: Monofilament or fibrillated polypropylene fibers for secondary reinforcing of concrete members. Use appropriate length and  $0.9 \text{ kg/m}^3$  (1.5 lb. per cubic yard). Product shall have a UL rating.
  2. Steel Fibers: ASTM A820, Type I cold drawn, high tensile steel wire for use as primary reinforcing in slab-on-grade. Minimum dosage rate  $18 \text{ kg/m}^3$  (30 lb. per cubic yard).
- AA. Epoxy Joint Filler: Two component, 100 percent solids compound, with a minimum shore D hardness of 50.
- BB. Bonding Admixture: Non-rewettable, polymer modified, bonding compound.

### **2.3 CONCRETE MIXES:**

- A. Mix Designs: Proportioned in accordance with Section 5.3, "Proportioning on the Basis of Field Experience and/or Trial Mixtures" of ACI 318.
1. If trial mixes are used, make a set of at least 6 cylinders in accordance with ASTM C192 for test purposes from each trial mix; test three for compressive strength at 7 days and three at 28 days.
  2. Submit a report of results of each test series, include a detailed listing of the proportions of trial mix or mixes, including cement, fly ash, admixtures, weight of fine and coarse aggregate per  $\text{m}^3$  (cubic yard) measured dry rodded and damp loose, specific gravity, fineness modulus, percentage of moisture, air content, water-cement ratio, and consistency of each cylinder in terms of slump.
  3. Prepare a curve showing relationship between water-cement ratio at 7-day and 28-day compressive strengths. Plot each curve using at least three specimens.
  4. If the field experience method is used, submit complete standard deviation analysis.
- B. Fly Ash Testing: Submit certificate verifying conformance with ASTM 618 initially with mix design and for each truck load of fly ash delivered from source. Submit test results performed within 6 months of submittal date. Notify COR immediately when change in source is anticipated.

10-01-12

1. Testing Laboratory used for fly ash certification/testing shall participate in the Cement and Concrete Reference Laboratory (CCRL) program. Submit most recent CCRL inspection report.
- C. After approval of mixes no substitution in material or change in proportions of approval mixes may be made without additional tests and approval of COR or as specified. Making and testing of preliminary test cylinders may be carried on pending approval of cement and fly ash, providing Contractor and manufacturer certify that ingredients used in making test cylinders are the same. COR may allow Contractor to proceed with depositing concrete for certain portions of work, pending final approval of cement and fly ash and approval of design mix.
- D. Cement Factor: Maintain minimum cement factors in Table I regardless of compressive strength developed above minimums. Use Fly Ash as an admixture with 20% replacement by weight in all structural work. Increase this replacement to 40% for mass concrete, and reduce it to 10% for drilled piers and caissons. Fly ash shall not be used in high-early mix design.

**TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE**

Concrete Strength		Non-Air-Entrained	Air-Entrained	
Min. 28 Day Comp. Str. MPa (psi)	Min. Cement kg/m <sup>3</sup> (lbs/c. yd)	Max. Water Cement Ratio	Min. Cement kg/m <sup>3</sup> (lbs/c. yd)	Max. Water Cement Ratio
35 (5000) <sup>1,3</sup>	375 (630)	0.45	385 (650)	0.40
30 (4000) <sup>1,3</sup>	325 (550)	0.55	340 (570)	0.50
25 (3000) <sup>1,3</sup>	280 (470)	0.65	290 (490)	0.55
25 (3000) <sup>1,2</sup>	300 (500)	*	310 (520)	*

1. If trial mixes are used, the proposed mix design shall achieve a compressive strength 8.3 MPa (1200 psi) in excess of f'c. For concrete strengths above 35 Mpa (5000 psi), the proposed mix design shall achieve a compressive strength 9.7 MPa (1400 psi) in excess of f'c.
2. Lightweight Structural Concrete. Pump mixes may require higher cement values.
3. For concrete exposed to high sulfate content soils maximum water cement ratio is 0.44.
4. Determined by Laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

10-01-12

- E. Maximum Slump: Maximum slump, as determined by ASTM C143 with tolerances as established by ASTM C94, for concrete to be vibrated shall be as shown in Table II.

**TABLE II - MAXIMUM SLUMP, MM (INCHES) \***

Type of Construction	Normal Weight Concrete	Lightweight Structural Concrete
Slabs, Beams, Reinforced Walls, and Building Columns	100 mm (4 inches)	100 mm (4 inches)

- F. Slump may be increased by the use of the approved high-range water-reducing admixture (superplasticizer). Tolerances as established by ASTM C94. Concrete containing the high-range-water-reducing admixture may have a maximum slump of 225 mm (9 inches). The concrete shall arrive at the job site at a slump of 50 mm to 75 mm (2 inches to 3 inches), and 75 mm to 100 mm (3 inches to 4 inches) for lightweight concrete. This should be verified, and then the high-range-water-reducing admixture added to increase the slump to the approved level.
- G. Air-Entrainment: Air-entrainment of normal weight concrete shall conform with Table III. Air-entrainment of lightweight structural concrete shall conform with Table IV. Determine air content by either ASTM C173 or ASTM C231.

**TABLE III - TOTAL AIR CONTENT  
FOR VARIOUS SIZES OF COARSE AGGREGATES (NORMAL CONCRETE)**

Nominal Maximum Size of Total Air Content	Coarse Aggregate, mm (Inches) Percentage by Volume
10 mm (3/8 in).6 to 10	13 mm (1/2 in).5 to 9
20 mm (3/4 in).4 to 8	25 mm (1 in).3-1/2 to 6-1/2
40 mm (1 1/2 in).3 to 6	

**TABLE IV  
AIR CONTENT OF LIGHTWEIGHT STRUCTURAL CONCRETE**

Nominal Maximum size of Total Air Content	Coarse Aggregate, mm's (Inches) Percentage by Volume
Greater than 10 mm (3/8 in) 4 to 8	10 mm (3/8 in) or less 5 to 9

- H. High early strength concrete, made with Type III cement or Type I cement plus non-corrosive accelerator, shall have a 7-day compressive strength equal to specified minimum 28-day compressive strength for concrete type specified made with standard Portland cement.

10-01-12

- I. Lightweight structural concrete shall not weigh more than air-dry unit weight shown. Air-dry unit weight determined on 150 mm by 300 mm (6 inch by 12 inch) test cylinders after seven days standard moist curing followed by 21 days drying at 23 degrees C  $\pm$  1.7 degrees C (73.4  $\pm$  3 degrees Fahrenheit), and 50 (plus or minus 7) percent relative humidity. Use wet unit weight of fresh concrete as basis of control in field.
- J. Concrete slabs placed at air temperatures below 10 degrees C (50 degrees Fahrenheit) use non-corrosive, non-chloride accelerator. Concrete required to be air entrained use approved air entraining admixture. Pumped concrete, synthetic fiber concrete, architectural concrete, concrete required to be watertight, and concrete with a water/cement ratio below 0.50 use high-range water-reducing admixture (superplasticizer).
- K. Durability: Use air entrainment for exterior exposed concrete subjected to freezing and thawing and other concrete shown or specified. For air content requirements see Table III or Table IV.
- L. Enforcing Strength Requirements: Seven-day tests may be used as indicators of 28-day strength. Average of any three 28-day consecutive strength tests of laboratory-cured specimens representing each type of concrete shall be equal to or greater than specified strength. No single test shall be more than 3.5 MPa (500 psi) below specified strength. Interpret field test results in accordance with ACI 214. Should strengths shown by test specimens fall below required values, COR may require any one or any combination of the following corrective actions, at no additional cost to the Government:
  - 1. Require changes in mix proportions by selecting one of the other appropriate trial mixes or changing proportions, including cement content, of approved trial mix.
  - 2. Require additional curing and protection.
  - 3. If five consecutive tests fall below 95 percent of minimum values given in Table I or if test results are so low as to raise a question as to the safety of the structure, COR may direct Contractor to take cores from portions of the structure. Use results from cores tested by the Contractor retained testing agency to analyze structure.
  - 4. If strength of core drilled specimens falls below 85 percent of minimum value given in Table I, COR may order load tests, made by Contractor retained testing agency, on portions of building so affected. Load tests in accordance with ACI 318 and criteria of acceptability of concrete under test as given therein.

10-01-12

5. Concrete work, judged inadequate by structural analysis, by results of load test, or for any reason, shall be reinforced with additional construction or replaced, if directed by the COR.

#### **2.4 BATCHING AND MIXING:**

- A. General: Concrete shall be "Ready-Mixed" and comply with ACI 318 and ASTM C94, except as specified. Batch mixing at the site is permitted. Mixing process and equipment must be approved by COR. With each batch of concrete, furnish certified delivery tickets listing information in Paragraph 16.1 and 16.2 of ASTM C94. Maximum delivery temperature of concrete is 38°C (100 degrees Fahrenheit). Minimum delivery temperature as follows:

Atmospheric Temperature	Minimum Concrete Temperature
-1. degrees to 4.4 degrees C (30 degrees to 40 degrees F)	15.6 degrees C (60 degrees F.)
-17 degrees C to -1.1 degrees C (0 degrees to 30 degrees F.)	21 degrees C (70 degrees F.)

1. Services of aggregate manufacturer's representative shall be furnished during the design of trial mixes and as requested by the COR for consultation during batching, mixing, and placing operations of lightweight structural concrete. Services will be required until field controls indicate that concrete of required quality is being furnished. Representative shall be thoroughly familiar with the structural lightweight aggregate, adjustment and control of mixes to produce concrete of required quality. Representative shall assist and advise COR.

### **PART 3 - EXECUTION**

#### **3.1 FORMWORK:**

- A. General: Design in accordance with ACI 347 is the responsibility of the Contractor. The Contractor shall retain a registered Professional Engineer to design the formwork, shores, and reshores.
1. Form boards and plywood forms may be reused for contact surfaces of exposed concrete only if thoroughly cleaned, patched, and repaired and COR approves their reuse.
  2. Corrugated fiberboard forms: Place forms on a smooth firm bed, set tight, with no buckled cartons to prevent horizontal displacement, and in a dry condition when concrete is placed.
- B. Treating and Wetting: Treat or wet contact forms as follows:

10-01-12

1. Coat plywood and board forms with non-staining form sealer. In hot weather, cool forms by wetting with cool water just before concrete is placed.
2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.
3. Use sealer on reused plywood forms as specified for new material.
- C. Unlined Forms: Use plywood forms to obtain a smooth finish for concrete surfaces. Tightly butt edges of sheets to prevent leakage. Back up all vertical joints solidly and nail edges of adjacent sheets to same stud with 6d box nails spaced not over 150 mm (6 inches) apart.
- D. Lined Forms: May be used in lieu of unlined plywood forms. Back up form lining solidly with square edge board lumber securely nailed to studs with all edges in close contact to prevent bulging of lining. No joints in lining and backing may coincide. Nail abutted edges of sheets to same backing board. Nail lining at not over 200 mm (8 inches) on center along edges and with at least one nail to each square foot of surface area; nails to be 3d blued shingle or similar nails with thin flatheads.
- E. Construction Tolerances:
  1. Set and maintain concrete formwork to assure erection of completed work within tolerances specified and to accommodate installation of other rough and finish materials. Accomplish remedial work necessary for correcting excessive tolerances. Erected work that exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.
  2. Permissible surface irregularities for various classes of materials are defined as "finishes" in specification sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

### **3.2 PLACING REINFORCEMENT:**

- A. General: Details of concrete reinforcement in accordance with ACI 318 unless otherwise shown.
- B. Placing: Place reinforcement conforming to CRSI DA4, unless otherwise shown.
  1. Place reinforcing bars accurately and tie securely at intersections and splices with 1.6 mm (16 gauge) black annealed wire. Use epoxy-coated tie wire with epoxy-coated reinforcing. Secure reinforcing bars against displacement during the placing of concrete by spacers, chairs, or other similar supports. Portions of supports, spacers, and

10-01-12

- chairs in contact with formwork shall be made of plastic in areas that will be exposed when building is occupied. Type, number, and spacing of supports conform to ACI 318. Where concrete slabs are placed on ground, use concrete blocks or other non-corrodible material of proper height, for support of reinforcement. Use of brick or stone supports will not be permitted.
2. Lap welded wire fabric at least 1 1/2 mesh panels plus end extension of wires not less than 300 mm (12 inches) in structural slabs. Lap welded wire fabric at least 1/2 mesh panels plus end extension of wires not less than 150 mm (6 inches) in slabs on grade.
  3. Splice column steel at no points other than at footings and floor levels unless otherwise shown.
- C. Spacing: Minimum clear distances between parallel bars, except in columns and multiple layers of bars in beams shall be equal to nominal diameter of bars. Minimum clear spacing is 25 mm (1 inch) or 1-1/3 times maximum size of coarse aggregate.
- D. Splicing: Splices of reinforcement made only as required or shown or specified. Accomplish splicing as follows:
1. Lap splices: Do not use lap splices for bars larger than Number 36 (Number 11). Minimum lengths of lap as shown.
  2. Welded splices: Splicing by butt-welding of reinforcement permitted providing the weld develops in tension at least 125 percent of the yield strength (fy) for the bars. Welding conform to the requirements of AWS D1.4. Welded reinforcing steel conform to the chemical analysis requirements of AWS D1.4.
    - a. Submit test reports indicating the chemical analysis to establish weldability of reinforcing steel.
    - b. Submit a field quality control procedure to insure proper inspection, materials and welding procedure for welded splices.
    - c. Department of Veterans Affairs retained testing agency shall test a minimum of three splices, for compliance, locations selected by COR.
  3. Mechanical Splices: Develop in tension and compression at least 125 percent of the yield strength (fy) of the bars. Stresses of transition splices between two reinforcing bar sizes based on area of smaller bar. Provide mechanical splices at locations indicated. Use approved exothermic, tapered threaded coupling, or swaged and threaded sleeve. Exposed threads and swaging in the field not permitted.

10-01-12

- a. Initial qualification: In the presence of COR, make three test mechanical splices of each bar size proposed to be spliced. Department of Veterans Affairs retained testing laboratory will perform load test.
- b. During installation: Furnish, at no additional cost to the Government, one companion (sister) splice for every 50 splices for load testing. Department of Veterans Affairs retained testing laboratory will perform the load test.
- E. Bending: Bend bars cold, unless otherwise approved. Do not field bend bars partially embedded in concrete, except when approved by COR.
- F. Cleaning: Metal reinforcement, at time concrete is placed, shall be free from loose flaky rust, mud, oil, or similar coatings that will reduce bond.
- G. Future Bonding: Protect exposed reinforcement bars intended for bonding with future work by wrapping with felt and coating felt with a bituminous compound unless otherwise shown.

**3.3 VAPOR BARRIER: NOT APPLICABLE**

**3.4 SLABS RECEIVING RESILIENT COVERING - NOT APPLICABLE**

**3.5 CONSTRUCTION JOINTS:**

- A. Unless otherwise shown, location of construction joints to limit individual placement shall not exceed 24,000 mm (80 feet) in any horizontal direction, except slabs on grade which shall have construction joints shown. Allow 48 hours to elapse between pouring adjacent sections unless this requirement is waived by COR.
- B. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.

**3.6 EXPANSION JOINTS AND CONTRACTION JOINTS:**

- A. Clean expansion joint surfaces before installing premolded filler and placing adjacent concrete.
- B. Install polyvinyl chloride or rubber water seals, as shown in accordance with manufacturer's instructions, to form continuous watertight seal.
- C. Provide contraction (control) joints in floor slabs as indicated on the contract drawings. Joints shall be either formed or saw cut, to the indicated depth after the surface has been finished. Complete saw joints within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

**3.7 PLACING CONCRETE:**

- A. Preparation:

10-01-12

1. Remove hardened concrete, wood chips, shavings and other debris from forms.
  2. Remove hardened concrete and foreign materials from interior surfaces of mixing and conveying equipment.
  3. Have forms and reinforcement inspected and approved by COR before depositing concrete.
  4. Provide runways for wheeling equipment to convey concrete to point of deposit. Keep equipment on runways which are not supported by or bear on reinforcement. Provide similar runways for protection of vapor barrier on coarse fill.
- B. Bonding: Before depositing new concrete on or against concrete which has been set, thoroughly roughen and clean existing surfaces of laitance, foreign matter, and loose particles.
1. Preparing surface for applied topping:
    - a. Remove laitance, mortar, oil, grease, paint, or other foreign material by sand blasting. Clean with vacuum type equipment to remove sand and other loose material.
    - b. Broom clean and keep base slab wet for at least four hours before topping is applied.
    - c. Use a thin coat of one part Portland cement, 1.5 parts fine sand, bonding admixture; and water at a 50: 50 ratio and mix to achieve the consistency of thick paint. Apply to a damp base slab by scrubbing with a stiff fiber brush. New concrete shall be placed while the bonding grout is still tacky.
- C. Conveying Concrete: Convey concrete from mixer to final place of deposit by a method which will prevent segregation. Method of conveying concrete is subject to approval of COR.
- D. Placing: For special requirements see Paragraphs, HOT WEATHER and COLD WEATHER.
1. Deposit concrete in forms as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
  2. Do not drop concrete freely more than 3000 mm (10 feet) for concrete containing the high-range water-reducing admixture (superplasticizer).
  3. Do not place concrete when weather conditions prevent proper placement and consolidation, or when concrete has attained its initial set, or has contained its water or cement content more than 1 1/2 or 1500 mm (5 feet) for conventional concrete. Where greater

10-01-12

drops are required, use a tremie or flexible spout (canvas elephant trunk), attached to a suitable hopper.

4. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 500 mm (20 inches) in thickness, and space tremies such as to provide a minimum of lateral movement of concrete.
5. Continuously place concrete until an entire unit between construction joints is placed. Rate and method of placing concrete shall be such that no concrete between construction joints will be deposited upon or against partly set concrete, after its initial set has taken place, or after 45 minutes of elapsed time during concrete placement.
6. On bottom of members with severe congestion of reinforcement, deposit 25 mm (1 inch) layer of flowing concrete containing the specified high-range water-reducing admixture (superplasticizer). Successive concrete lifts may be a continuation of this concrete or concrete with a conventional slump.

- E. Consolidation: Conform to ACI 309. Immediately after depositing, spade concrete next to forms, work around reinforcement and into angles of forms, tamp lightly by hand, and compact with mechanical vibrator applied directly into concrete at approximately 450 mm (18 inch) intervals. Mechanical vibrator shall be power driven, hand operated type with minimum frequency of 5000 cycles per minute having an intensity sufficient to cause flow or settlement of concrete into place. Vibrate concrete to produce thorough compaction, complete embedment of reinforcement and concrete of uniform and maximum density without segregation of mix. Do not transport concrete in forms by vibration.
1. Use of form vibration shall be approved only when concrete sections are too thin or too inaccessible for use of internal vibration.
  2. Carry on vibration continuously with placing of concrete. Do not insert vibrator into concrete that has begun to set.

### **3.8 HOT WEATHER:**

Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.

### **3.9 COLD WEATHER:**

Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not

10-01-12

use calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.

### **3.10 PROTECTION AND CURING:**

A. Conform to ACI 308: Initial curing shall immediately follow the finishing operation. Protect exposed surfaces of concrete from premature drying, wash by rain and running water, wind, mechanical injury, and excessively hot or cold temperatures. Keep concrete not covered with membrane or other curing material continuously wet for at least 7 days after placing, except wet curing period for high-early-strength concrete shall be not less than 3 days. Keep wood forms continuously wet to prevent moisture loss until forms are removed. Cure exposed concrete surfaces as described below. Other curing methods may be used if approved by COR.

1. Liquid curing and sealing compounds: Apply by power-driven spray or roller in accordance with the manufacturer's instructions. Apply immediately after finishing. Maximum coverage 10m<sup>2</sup>/L (400 square feet per gallon) on steel troweled surfaces and 7.5m<sup>2</sup>/L (300 square feet per gallon) on floated or broomed surfaces for the curing/sealing compound.
2. Plastic sheets: Apply as soon as concrete has hardened sufficiently to prevent surface damage. Utilize widest practical width sheet and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with tape.
3. Paper: Utilize widest practical width paper and overlap adjacent sheets 50 mm (2 inches). Tightly seal joints with sand, wood planks, pressure-sensitive tape, mastic or glue.

### **3.11 REMOVAL OF FORMS:**

- A. Remove in a manner to assure complete safety of structure after the following conditions have been met.
- B. Control Test: Use to determine if the concrete has attained sufficient strength and curing to permit removal of supporting forms. Cylinders required for control tests taken in accordance with ASTM C172, molded in accordance with ASTM C31, and tested in accordance with ASTM C39. Control cylinders cured and protected in the same manner as the structure they represent. Supporting forms or shoring not removed until strength of control test cylinders have attained at least 70 percent of minimum 28-day compressive strength specified. Exercise care to assure

10-01-12

that newly unsupported portions of structure are not subjected to heavy construction or material loading.

- C. Reshoring: Reshoring is required if superimposed load plus dead load of the floor exceeds the capacity of the floor at the time of loading. In addition, for flat slab/plate, reshoring is required immediately after stripping operations are complete and not later than the end of the same day. Reshoring accomplished in accordance with ACI 347 at no additional cost to the Government.

### **3.12 CONCRETE SURFACE PREPARATION:**

- A. Metal Removal: Unnecessary metal items cut back flush with face of concrete members.
- B. Patching: Maintain curing and start patching as soon as forms are removed. Do not apply curing compounds to concrete surfaces requiring patching until patching is completed. Use cement mortar for patching of same composition as that used in concrete. Use white or gray Portland cement as necessary to obtain finish color matching surrounding concrete. Thoroughly clean areas to be patched. Cut out honeycombed or otherwise defective areas to solid concrete to a depth of not less than 25 mm (1 inch). Cut edge perpendicular to surface of concrete. Saturate with water area to be patched, and at least 150 mm (6 inches) surrounding before placing patching mortar. Give area to be patched a brush coat of cement grout followed immediately by patching mortar. Cement grout composed of one part Portland cement, 1.5 parts fine sand, bonding admixture, and water at a 50:50 ratio, mix to achieve consistency of thick paint. Mix patching mortar approximately 1 hour before placing and remix occasionally during this period without addition of water. Compact mortar into place and screed slightly higher than surrounding surface. After initial shrinkage has occurred, finish to match color and texture of adjoining surfaces. Cure patches as specified for other concrete. Fill form tie holes which extend entirely through walls from unexposed face by means of a pressure gun or other suitable device to force mortar through wall. Wipe excess mortar off exposed face with a cloth.
- C. Upon removal of forms, clean vertical concrete surface that is to receive bonded applied cementitious application with wire brushes or by sand blasting to remove unset material, laitance, and loose particles to expose aggregates to provide a clean, firm, granular surface for bond of applied finish.

### **3.13 CONCRETE FINISHES:**

- A. Slab Finishes:

10-01-12

1. Monitoring and Adjustment: Provide continuous cycle of placement, measurement, evaluation and adjustment of procedures to produce slabs within specified tolerances. Monitor elevations of structural steel in key locations before and after concrete placement to establish typical deflection patterns for the structural steel. Determine elevations of cast-in-place slab soffits prior to removal of shores. Provide information to COR and floor consultant for evaluation and recommendations for subsequent placements.
2. Set perimeter forms to serve as screed using either optical or laser instruments. For slabs on grade, wet screeds may be used to establish initial grade during strike-off, unless COR determines that the method is proving insufficient to meet required finish tolerances and directs use of rigid screed guides. Where wet screeds are allowed, they shall be placed using grade stakes set by optical or laser instruments. Use rigid screed guides, as opposed to wet screeds, to control strike-off elevation for all types of elevated (non slab-on-grade) slabs. Divide bays into halves or thirds by hard screeds. Adjust as necessary where monitoring of previous placements indicates unshored structural steel deflections to other than a level profile.
3. Place slabs monolithically. Once slab placement commences, complete finishing operations within same day. Slope finished slab to floor drains where they occur, whether shown or not.
4. Use straightedges specifically made for screeding, such as hollow magnesium straightedges or power strike-offs. Do not use pieces of dimensioned lumber. Strike off and screed slab to a true surface at required elevations. Use optical or laser instruments to check concrete finished surface grade after strike-off. Repeat strike-off as necessary. Complete screeding before any excess moisture or bleeding water is present on surface. Do not sprinkle dry cement on the surface.
5. Immediately following screeding, and before any bleed water appears, use a 3000 mm (10 foot) wide highway straightedge in a cutting and filling operation to achieve surface flatness. Do not use bull floats or darbys, except that darbying may be allowed for narrow slabs and restricted spaces.
6. Wait until water sheen disappears and surface stiffens before proceeding further. Do not perform subsequent operations until concrete will sustain foot pressure with maximum of 6 mm (1/4 inch) indentation.

10-01-12

7. Scratch Finish: Finish base slab to receive a bonded applied cementitious application as indicated above, except that bull floats and darbys may be used. Thoroughly coarse wire broom within two hours after placing to roughen slab surface to insure a permanent bond between base slab and applied materials.
8. Float Finish: Slabs to receive unbonded toppings, steel trowel finish, fill, mortar setting beds, or a built-up roof, and ramps, stair treads, platforms (interior and exterior), and equipment pads shall be floated to a smooth, dense uniform, sandy textured finish. During floating, while surface is still soft, check surface for flatness using a 3000 mm (10 foot) highway straightedge. Correct high spots by cutting down and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections and re-float to a uniform texture.
9. Broom Finish: Finish exterior slabs, ramps, and stair treads with a bristle brush moistened with clear water after surfaces have been floated. Brush in a direction transverse to main traffic. Match texture approved by COR from sample panel.
10. Finished slab flatness (FF) and levelness (FL) values comply with the following minimum requirements:
  - a. Areas that will be exposed:
    - 1) Slab on grade:
      - a) Specified overall value FF 36/FL 20
      - b) Minimum local value FF 24/FL 15
    - 2) Level tolerance such that 80 percent of all points fall within a 20 mm (3/4 inch) envelope +10 mm, -10 mm (+3/8 inch, -3/8 inch) from the design elevation.
  - b. "Specified overall value" is based on the composite of all measured values in a placement derived in accordance with ASTM E1155.
  - c. "Minimum local value" (MLV) describes the flatness or levelness below which repair or replacement is required. MLV is based on the results of an individual placement and applies to a minimum local area. Minimum local area boundaries may not cross a construction joint or expansion joint. A minimum local area will be bounded by construction and/or control joints, or by column lines and/or half-column lines, whichever is smaller.
11. Measurements
  - a. Department of Veterans Affairs retained testing laboratory will take measurements as directed by COR, to verify compliance with

10-01-12

FF, FL, and other finish requirements. Measurements will occur within 72 hours after completion of concrete placement (weekends and holidays excluded). Make measurements before shores or forms are removed to insure the "as-built" levelness is accurately assessed. Profile data for above characteristics may be collected using a laser level or any Type II apparatus (ASTM E1155, "profileograph" or "dipstick"). Contractor's surveyor shall establish reference elevations to be used by Department of Veterans Affairs retained testing laboratory.

- b. Contractor not experienced in using FF and FL criteria is encouraged to retain the services of a floor consultant to assist with recommendations concerning adjustments to slab thicknesses, finishing techniques, and procedures on measurements of the finish as it progresses in order to achieve the specific flatness and levelness numbers.
12. Acceptance/ Rejection:
- a. If individual slab section measures less than either of specified minimum local  $F_F/F_L$  numbers, that section shall be rejected and remedial measures shall be required. Sectional boundaries may be set at construction and contraction (control) joints, and not smaller than one-half bay.
  - b. If composite value of entire slab installation, combination of all local results, measures less than either of specified overall  $F_F/F_L$  numbers, then whole slab shall be rejected and remedial measures shall be required.
13. Remedial Measures for Rejected Slabs: Correct rejected slab areas by grinding, planing, surface repair with underlayment compound or repair topping, retopping, or removal and replacement of entire rejected slab areas, as directed by COR, until a slab finish constructed within specified tolerances is accepted.

### **3.14 SURFACE TREATMENTS:**

- A. Use on exposed concrete floors.
- B. Liquid Densifier/Sealer: Apply in accordance with manufacturer's directions just prior to completion of construction.
- C. Non-Slip Finish: Except where safety nosing and tread coverings are shown, apply non-slip abrasive aggregate to treads and platforms of concrete steps and stairs, and to surfaces of exterior concrete ramps and platforms. Broadcast aggregate uniformly over concrete surface at rate of application of 8% per 1/10th  $m^2$  (7.5 percent per square foot) of area. Trowel concrete surface to smooth dense finish. After curing, rub

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

10-01-12

treated surface with abrasive brick and water to slightly expose  
abrasive aggregate.

**3.15 APPLIED TOPPING: NOT APPLICABLE**

**3.16 RESURFACING FLOORS: NOT APPLICABLE**

**3.17 RETAINING WALLS: NOT APPLICABLE**

**3.18 PRECAST CONCRETE ITEMS: NOT APPLICABLE**

- - - E N D - - -

**SECTION 04 05 13  
MASONRY MORTARING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

Section specifies mortar materials and mixes. Intent of section is to create a mortar matching existing un-weathered historic mortar in color, composition, hardness and strength.

**1.2 RELATED WORK:**

- A. Mortar used in Section:
  - 1. Section 04 05 31, MASONRY TUCK POINTING.
  - 2. Section 04 50 00, MASONRY RESTORATION AND CLEANING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Cement, each kind.
  - 2. Hydrated lime.
- C. Final mortar proportions resulting from Contractors sampling, testing and matching of existing historic mortar, including sand gradation, to be used in all masonry work.

**1.4 PRISM TESTS**

- A. Before starting masonry work, construct two prisms with cleaned brick salvaged from existing building, and two prisms with brick salvaged by material suppliers from offsite locations and proposed for use as a substitution for existing damaged brick.
  - 1. Construct prisms with mortar proportions and construction methods matching existing construction as closely as possible, and approved by COR as described in 04 05 13 Masonry Mortar.
  - 2. For prisms constructed with cleaned brick salvaged from existing building, use undamaged brick masonry units from both interior and exterior wythes. Carefully remove existing hardened mortar from units utilizing hand tools only. No abrasive blasting, chemicals, or any process that may damage or mark the existing brick may be used.
  - 3. For prisms constructed with brick salvaged from other jobsites by material suppliers, use masonry units from random cubes of units delivered on site.
  - 4. Prisms shall be constructed on site by masons that will perform the repair work. Store prisms in a secure location until they have cured

sufficiently to permit transportation without damage. Transport prisms to Testing Laboratory for final curing.

5. Test prisms in accordance with ASTM C1314. Verify that the average prism strength of the tests for each type of brick is at least equal to 1000 psi, and is no greater than the prism strength of existing brick masonry (1350 psi). Documentation of testing program and results for existing brick masonry prism and mortar pin tests is on file with Owner. Contact AE if prism strength tests do not fall within limits indicated.

#### **1.5 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.
- B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

#### **1.6 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - C40-04.....Organic Impurities in Fine Aggregates for Concrete
  - C91-05.....Masonry Cement
  - C109-08.....Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-MM Cube Specimens)
  - C144-04.....Aggregate for Masonry Mortar
  - C150-09.....Portland Cement
  - C207-06.....Hydrated Lime for Masonry Purposes
  - C270-10.....Mortar for Unit Masonry
  - C780-10.....Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry

### **PART 2 - PRODUCTS**

#### **2.1 HYDRATED LIME**

Hydrated Lime shall be pressure hydrated non-air entrained and conform to ASTM C207, Type S.

#### **2.2 AGGREGATE FOR MASONRY MORTAR**

- A. Aggregate shall be natural river sand (manufactured or masons sand is not permitted), clean, free from loam, silt, vegetable matter, salts and other injurious substances:
  1. Sand shall be from one source.

2. Sand gradation shall be sieved to achieve gradation matching existing construction.
3. Color value of sand established in accordance with ASTM C40 shall match color value of original sand aggregate as closely as possible.

### **2.3 PORTLAND CEMENT**

- A. Portland cement shall conform to ASTM C150 Type  
  1. Only one brand and type of Portland cement from one source shall be used for the Work. Brands are subject to approval for color match of existing mortar. Use of either white or gray Portland cement, or a mix of white and gray Portland cements is permitted if required for color match of existing mortar.

### **2.4 WATER**

Potable, free of substances that are detrimental to mortar, masonry, and metal.

### **2.5 MASONRY MORTAR**

- A. Pre-packaged mortar mixes are not acceptable. Mortar shall be mixed from individual constituent parts on the jobsite.
- B. Masonry mortar at brick is to be no harder than ASTM Type O.
- C. Masonry mortar at stonework is to be ASTM Type N.
- D. Acceptability of mortar proportions based on appearance will be determined by COR, as described in 04 05 31 Masonry Tuck Pointing. After mortar has been determined by COR to satisfactorily match existing texture and color, the prism strength of mortar and masonry units shall be confirmed by prism test as described above.
- E. Final proportions of mortar judged visually acceptable and meeting strength requirements shall be submitted for written approval.
- F. Admixtures:
  1. Do not use mortar admixtures.
  2. Do not use antifreeze compounds.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Do not begin any repair work requiring mortar until receipt of written approval of mortar mix.

### **3.2 MIXING**

- A. Mix in a mechanically operated mortar mixer.
  1. Mix mortar for at least three minutes but not more than five minutes.
- B. Measure ingredients by volume. Measure by the use of a container of known capacity.

- C. Mix water with dry ingredients in sufficient amount to provide a workable mixture which will adhere to vertical surfaces of masonry units.
- D. Mortar that has stiffened because of loss of water through evaporations may be re-tempered by adding water to restore to proper consistency and workability. Discard mortar that has reached its initial set or has not been used within two hours.

### **3.2 MORTAR USE LOCATION**

- A. Use approved mortar at all locations, including repair and rebuilding of existing walls, and for tuck pointing.

- - - E N D - - -

**SECTION 04 05 31**  
**MASONRY TUCK POINTING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies requirements for tuck pointing of existing masonry and stone work.

**1.2 RELATED WORK**

- A. Mortars: Section 04 05 13, MASONRY MORTARING.
- B. Removal, replacement, restoration and cleaning of masonry and stone: Section 04 50 00, MASONRY RESTORATION AND CLEANING.

**1.3 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - C67-07.....Brick and Structural Clay Tile, Sampling and Testing
  - C216-07.....Facing Brick (Solid Masonry Units Made From Clay or Shale)
  - C270-07.....Mortar for Unit Masonry
- C. International Masonry Institute: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- D. Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings", published by the United States Department of the Interior, Cultural Resources.

**1.4 QUALITY CONTROL**

- A. All personnel employed by the General Contractor or Masonry Contractor to perform any work under this section, shall be qualified by training and experience to perform the work, and shall specifically have a minimum of two years of documented experience in the tuckpointing repair of masonry in buildings of similar age and character.

**PART 2 - PRODUCTS**

**2.1 TUCK POINTING MORTAR**

Tuck pointing mortar shall be as described in 04 05 13 MASONRY MORTARING.

**2.2 REPLACEMENT MASONRY UNITS**

- A. See Section 04 50 00, MASONRY RESTORATION AND CLEANING.

### **PART 3 - EXECUTION**

#### **3.1 TEST AREA REQUIREMENTS**

- A. Test Area to be 3 to 4 square feet in area. Test Area location to be located in obscure area of the building, as indicated on drawings or directed by COR.
- B. Test Area to be inspected and approved by COR before proceeding, and will be held as the standard for the remainder of the work.
- C. Test Area to match appearance, tooling and composition of original unweathered construction.
- D. Test Area shall be constructed by the same personnel that will be performing the specified work of the section on the building.
- E. Upon 48 hours' notice, the VA or its designated agent shall notify the SHPO that a test area has been produced and is available for inspection. Regardless of SHPO participation, the VA shall ensure the participation of a historic architect, whose qualifications meet the requirements of 36 CFR 61. Prior to issuance of its approval, the COR must receive from the SHPO or the historic architect, an opinion, in writing, that the tuck pointing is consistent with the Secretary of the Interior's Standards.

#### **3.2 CUT OUT OF EXISTING MORTAR JOINTS**

- A. Cut out existing mortar joints (both bed and head joints) and remove by means of a toothing chisel or a special pointer's grinder, to a uniform depth of to 19 mm (3/4-inch), or until sound mortar is reached, whichever is greater. Mortar removal must not damage or mark edges or surfaces of existing masonry units to remain.
- B. Remove dust and debris from the joints by brushing, blowing with air or rinsing with water. Do not rinse when temperature is below freezing.

#### **3.3 JOB CONDITIONS**

- A. Protection: Protect newly pointed joints from rain, until pointed joints are sufficiently hard enough to prevent damage.
- B. Cold Weather Protection:
  - 1. Tuck pointing may be performed in freezing weather when methods of protection are utilized.
  - 2. Comply with applicable sections of "Recommended Practices for Cold Weather Construction" as published by International Masonry Industry All Weather Council.
  - 3. Existing surfaces at temperatures to prevent mortar from freezing or causing other damage to mortar.

### **3.4 MIXING OF TUCK POINTING MORTAR**

- A. Mix dry ingredients with enough water to produce a damp mixture of workable consistency which will retain its shape when formed into a ball.
- B. Allow mortar to stand in dampened condition for one to 1-1/2 hours.
- C. Add water to bring mortar to a workable consistency prior to application.

### **3.5 INSTALLATION OF TUCK POINTING MORTAR**

- A. Immediately prior to application of mortar, dampen joints to be tuck pointed. Prior to application of pointing mortar, allow masonry units to absorb surface water.
- B. Tightly pack mortar into joints in thin layers, approximately 6 mm (1/4-inch) thick maximum.
- C. Allow layer to become "thumbprint hard" before applying next layer.
- D. Pack final layer flush with surfaces of masonry units. When mortar becomes "thumbprint hard", tool joints.

### **3.6 TOOLING OF JOINTS**

- A. Tool joints in patch work with a jointing tool to match the existing surrounding joints.

### **3.7 REPLACEMENT OF MASONRY UNITS**

- A. See Section 04 50 00, MASONRY RESTORATION AND CLEANING.

### **3.6 CLEANING**

- A. Clean exposed masonry surfaces on completion.
- B. Remove mortar droppings and other foreign substances from wall surfaces.
- C. First wet surfaces with clean water, then wash down with a solution of soapless detergent specially prepared for cleaning brick.
- D. Brush with stiff fiber brushes while washing, and immediately thereafter hose down with clean water.
- E. Free clean surfaces from traces of detergent, foreign streaks or stains. Protect materials during cleaning operations including adjoining construction.
- F. Use of muriatic acid, sand blasting, or water wash containing abrasive materials is prohibited in the cleaning of masonry. Pressure washer must not exceed 1000psi with spray nozzle to be held a minimum of 12" for wall surface.

- - - E N D - - -

**SECTION 04 50 00**  
**MASONRY RESTORATION AND CLEANING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies requirements for restoration and cleaning of existing masonry walls.
- B. Extent of masonry restoration work is indicated on drawings and photos, and includes the following:
  - 1. Preliminary cleaning, including removing plant growth.
  - 2. Cleaning exposed brick and stone masonry surfaces.
  - 3. Repairing brick and stone, including replacing damaged brick and stone units.
  - 4. Re-anchoring stone and brick veneers.
  - 5. Removal of paint from brick masonry.

**1.2 RELATED WORK**

- A. Mortars: Section 04 05 13, MASONRY MORTARING
- B. Masonry tuck pointing: Section 04 05 31, MASONRY TUCK POINTING.
- C. Sealants and sealant installation: Section 07 92 00, JOINT SEALANTS.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
  - 1. Each type of chemical cleaning and solvent material data.
  - 2. Stone masonry patching materials product data and application instructions.
- C. Samples: Submit, for verification purposes, prior to test panel erection, samples of the following:
  - 1. Each new exposed masonry material to be used for replacing existing materials. Include in each set of samples the full range of colors and textures to be expected in completed work.
    - a. For bricks, provide straps or panels containing not less than 4 units.
    - b. For stone, provide samples not less than 12" x 12" in size.
  - 2. Each type of masonry patching compound in the form of briquettes, at least 3 inches long by 1-1/2 inches wide. Document each Sample with manufacturer and stock number or other information necessary to order additional material.

3. Each type of chemical cleaning material.
  4. Each type of chemical solvent material.
  5. Each type of epoxy filler and adhesive.
  6. Each type of paint removal system.
- D. Restoration Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for restoration work, including protection of surrounding materials and Project site.

#### **1.4 TEST AREA**

- A. Prepare test areas for restoration and cleaning to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Cleaning: Use test panel to test cleaning methods and ensure that neither the masonry nor the mortar is damaged in the process. Begin with the gentlest means possible, starting with just water; then, if necessary, a water and white vinegar mix; water and detergent; and finally chemical cleaners.
  2. Brick Unit Masonry Repair: Prepare sample areas for brick indicated to have repair work performed. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
    - a. Replacement:
      1. Four brick units replaced.
    - b. Re-anchoring veneers: Install three masonry repair anchors in mockup wall assembly of each anchor type required.
  3. Stone Repair: Prepare sample areas for each type of stone indicated to have repair work performed. Erect sample areas in existing walls unless otherwise indicated, to demonstrate quality of materials, workmanship, and blending with existing work. Include the following as a minimum:
    - a. Crack repair: Two separate areas as directed.
    - b. Patching: Three small holes or chips as directed.
  4. Paint Removal: Use test panel to test paint removal methods and ensure that neither the masonry nor the mortar is damaged in the process.
- B. Test area to be 3 to 4 feet square in area. Test area to be located in obscure area of the building, as indicated on drawings or directed by COR.
- C. Test area to be inspected and approved by COR before proceeding, and will be held as the standard for the remainder of the work.

- D. Test area shall be prepared by the same personnel that will be performing the specified work of this section on the building.
- E. Test area shall be prepared when wall and air temperatures are similar to the temperatures anticipated at the time the masonry will be cleaned.
- F. Upon 48 hours' notice, the VA or its designated agent shall notify the SHPO that a test area has been produced and is available for inspection. Regardless of SHPO participation, the VA shall ensure the participation of a historic architect, whose qualifications meet the requirements of 36 CFR 61. Prior to issuance of its approval, the COR must receive from the SHPO or the historic architect, an opinion, in writing, that the restoration and cleaning is consistent with the Secretary of the Interior's Standards.
- G. Approved test areas may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.5 QUALITY CONTROL**

- A. Restoration Specialist Qualifications: Engage an experienced, Pre-approved masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.
  - 1. Restoration worker qualifications: Persons who are experienced and specialize in restoration work of types they will be performing. When masonry units are being patched, assign at least one worker among those performing patching work who is trained and certified by manufacturer of patching compound to apply its products.
- B. Chemical-Cleaner and Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- C. Paint Removal System Manufacturer Qualifications: A firm regularly engaged in producing masonry paint removal systems that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver masonry units to Project site strapped together in suitable packs by packs or pallets or in heavy-duty cartons.

- B. Deliver other materials to Project site in manufacturer's original and unopened containers and packaging bearing labels with manufacturer's name and type of products.
- C. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

#### **1.7 PROJECT CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.
- B. Repair masonry units only when air temperature is between 40 and 90 deg F and is predicted to remain so for at least 7 days after completion of the Work unless otherwise directed.
- C. Cold-Weather Requirements: Comply with the following procedures for masonry repair unless otherwise indicated:
  - 1. When air temperature is below 40 deg F, heat masonry repair materials, and existing masonry walls to produce temperatures between 40 and 120 deg F.
  - 2. When mean daily air temperature is below 40 deg F, provide enclosure and heat to maintain temperatures above 32 deg F within the enclosure for 7 days after repair work.
- D. Hot-Weather Requirements: Protect masonry repair when temperature and humidity conditions produce excessive evaporation of water from repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F and above unless otherwise indicated.
- E. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.
- F. Clean masonry surfaces with chemical cleaners only when air temperature is 50 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.
- G. Use other liquid cleaning methods only when air temperature is 40 deg F and above and is predicted to remain so for at least 7 days after completion of cleaning.

#### **1.8 SEQUENCING AND SCHEDULING OF MASONRY CLEANING:**

- A. Perform masonry restoration work in the following sequence:

1. Repair sources of water damage, including the repair of flashings.
2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
3. Remove building sealers, stains, plants and biological growth from masonry surfaces.
4. Clean masonry surfaces.
5. Rake out mortar from joints surrounding masonry to be replaced and from joints adjacent to masonry repairs along joints.
6. Repair masonry, including replacing existing masonry with new or salvaged masonry materials.
7. Rake out mortar from joints to be repointed, per Section 04 05 31 MASONRY TUCK POINTING.
8. Point mortar and sealant joints, per Section 04 05 13 MASONRY MORTARING, Section 04 05 31 MASONRY TUCK POINTING, and Section 07 92 00 JOINT SEALANTS.
9. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

B. Where the erection of scaffolding is necessary to perform the work, scaffolding must be free-standing and self-supporting. Securing of scaffolding to building shall not be permitted.

## **PART 2 - PRODUCTS**

### **2.1 BRICK MASONRY MATERIALS**

#### **A. Face Brick:**

1. Reclaimed brick from this site or other locations. In good condition; broken and cracked brick are not acceptable.
2. Face brick shall match facing brick of the existing building in both appearance and hardness.

### **2.2 STONE MATERIALS**

A. Provide natural building stone of variety, color, texture, grain, veining, finish, size and shape to match existing stone.

B. Salvaged Stone: Salvage existing stone as indicated for reinstallation on the drawings. Clean of residual mortar.

### **2.3 MORTAR MATERIALS**

A. As described in Section 04 05 13, MASONRY MORTARING.

### **2.4 MANUFACTURED REPAIR MATERIALS**

A. Stone Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching stone.

1. Use formulation that is vapor and water permeable (equal to or more than the stone), exhibits low shrinkage, has lower modulus of

- elasticity than the stone units being repaired, and develops high bond strength to all types of stone.
2. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.
  3. Formulate patching compound in colors, textures, and grain to match stone being patched. Provide sufficient number of colors to enable matching each piece of stone.
- B. Stone-To-Stone Adhesive: 2-part polyester or epoxy-resin stone adhesive with a 15- to 45- minute cure at 70 deg F, recommended by adhesive manufacturer for type of stone repair indicated, and matching stone color.

## **2.5 CLEANING MATERIALS AND EQUIPMENT**

- A. Water: Potable
- B. Hot Water: Water heated to a temperature of 140 to 160 deg F.
- C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 1/2 cup of laundry detergent, and 20 quarts of hot water for every 5 gal. of solution required.
- D. Job-Mixed Mold, Mildew, and Algae Remover: Solution prepared by mixing 2 cups of tetrasodium polyphosphate, 5 quarts of 5% sodium hypochlorite (bleach) and 15 quarts of hot water for every 5 gal. of solution required.
- E. Acidic Cleaner: Manufacturer's standard acidic masonry cleaner composed of hydrofluoric acid or ammonium bifluoride blended with other acids, detergents, wetting agents, and inhibitors.
- F. Chemical Solvent: Manufacturer's standard silicone "digestant", formulated to remove silicone-based building sealants.
- G. Brushes: Fiber bristle only.
- H. Spray Equipment: Provide equipment for controlling spray application of water and chemical cleaners, if any, at rates indicated for pressure, measured at spray tip, and for volume.
  1. For spray application of chemical cleaners provide low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray-tip.
  2. For spray application of water provide fan-shaped spray-tip which disperses water at angle of not less than 15 degrees.
  3. For spray application of heated water provide equipment capable of maintain temperature, at flow rates indicated, between 140° and 160 °.

## **2.6 ACCESSORY MATERIALS**

- A. Liquid Strippable Masking Agent: Manufacturer's standard liquid, film-forming, strippable masking material for protecting glass, metal, and

polished stone surfaces from damaging effects of acidic and alkaline masonry cleaners.

- B. Stone Anchors and Pins: To match existing anchors in size and type. Fabricate anchors and pins from Type 304 stainless steel.

## **2.7 CHEMICAL CLEANING SOLUTIONS**

- A. Dilute chemical cleaners with water to produce solutions not exceeding concentration recommended by chemical-cleaner manufacturer.
- B. Acidic Cleaner Solution for Brick: Dilute with water to produce hydrofluoric acid content of 3 percent or less, but not greater than that recommended by chemical-cleaner manufacturer.

## **PART 3 - EXECUTION**

### **3.1 PROTECTION**

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.
1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.
- B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.
1. Cover adjacent surfaces with materials that are proven to resist chemical cleaners used unless chemical cleaners being used will not damage adjacent surfaces. Use materials that contain only waterproof, UV-resistant adhesives. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
  2. Keep wall wet below area being cleaned to prevent streaking from runoff.
  3. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
  4. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
  5. Dispose of runoff from cleaning operations by legal means and in a manner that prevents soil erosion, undermining of paving and

foundations, damage to landscaping, and water penetration into building interiors.

- C. Prevent mortar from staining face of surrounding masonry and other surfaces.
  - 1. Cover sills, ledges, and projections to protect from mortar droppings.
  - 2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
  - 3. Immediately remove mortar in contact with exposed masonry and other surfaces.
  - 4. Clean mortar splatters from scaffolding at end of each day.

### **3.2 CLEANING MASONRY, GENERAL**

- A. Proceed with cleaning in an orderly manner; work from bottom to top of the test cleaning area of each scaffold width and from one end of the test area to the other. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.
- B. Use only those cleaning methods that have been tested on sample panels and approved by COR for each masonry material and location.
  - 1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
  - 2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonry.
    - a. Equip units with pressure gages.
    - b. Water pressure must not exceed 1,000 psi.**
  - 3. For chemical-cleaner spray application, use low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray tip.
  - 4. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
  - 5. Use of muriatic acid, sand blasting, or water wash containing abrasive materials is prohibited in the cleaning of masonry.
- C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.
- D. Water Application Methods:
  - 1. Water-Spray Applications: Unless otherwise indicated, hold spray nozzle at least 12 inches from surface of masonry and apply water in

horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

- E. Chemical-Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical-cleaner manufacturer's written instructions; use brush or spray application. Do not spray apply at pressures exceeding 50 psi. Do not allow chemicals to remain on surface for periods longer than those indicated or recommended by manufacturer.
- F. Rinse off chemical residue and soil by working upward from bottom to top of each treated area at each stage or scaffold setting. Periodically during each rinse, test pH of rinse water running off of cleaned area to determine that chemical cleaner is completely removed.
  - 1. Apply neutralizing agent and repeat rinse if necessary to produce tested pH of between 6.7 and 7.5.
  - 2. After cleaning is complete, remove protection no longer required.Remove tape and adhesive marks.

### **3.3 PRELIMINARY CLEANING**

- A. Removing Plant Growth: Completely remove visible plant, moss, and shrub growth from masonry surfaces. Carefully remove plants, creepers, and vegetation by cutting at roots and allotting to dry as long as possible before removal. Remove loose soil and debris from open masonry joints to whatever depth they occur.
  - 1. Remove dried vine creepers by scrubbing with a stiff bristle brush.

### **3.4 CLEANING STONEWORK AND BRICKWORK**

- A. Cold-Water Wash: Use cold water applied by very low-pressure spray.
- B. Job-Mixed Detergent Solution
  - 1. Wet masonry with cold water applied by low-pressure spray.
  - 2. Apply detergent solution by brush or very low-pressure spray.
  - 3. Scrub masonry with medium-soft brushes until soil can be removed by rinsing. Use small brushes for mortar joins and crevices. Dip brush in detergent solution often to ensure that adequate fresh cleaner is used and that masonry surface remains wet.
  - 4. Rinse with cold water applied by very-low pressure spray to remove mold, mildew, algae, and soil.
  - 5. Stains that remain on stonework and brickwork after this process will be treated with chemical cleaners designed to remove specific types of chemical residue.
- C. Acidic Chemical Cleaning:
  - 1. Wet masonry with cold water applied by very low-pressure spray.

2. Apply cleaner to masonry in two applications by brush or very low-pressure spray. Let cleaner remain on surface for period indicated below.
  - a. As recommended by chemical-cleaner manufacturer.
3. Rinse with cold water applied by very low-pressure spray to remove chemicals and soil.

### **3.5 STONE REMOVAL AND REPLACEMENT**

- A. At locations indicated, remove stone that has deteriorated or is damaged beyond repair or is indicated to be removed and reinstalled to facilitate repairs to underlying structure. Carefully demolish or remove entire units from joint to joint, without damaging surrounding stone, in a manner that permits replacement with full-size units.
- B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing stone, rotted wood, rusted metal, and other deteriorated items.
- D. Remove in an undamaged condition as many whole stone units as possible.
  1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes and water.
  2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
  3. Store stone for reuse. Store off ground, on skids, and protected from weather.
  4. Deliver cleaned stone not required for reuse to Owner unless otherwise indicated.
- E. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Replace removed damaged stone with other removed stone and salvaged stone in good quality, where possible, or with new stone matching existing stone, including size. Do not use broken units unless they can be cut to usable size.
- G. Install replacement stone into bonding and coursing pattern of existing stone. If cutting is required, use a motor-driven saw designed to cut stone with clean, sharp, unchipped edges. Finish edges to blend with appearance of edges of existing stone.
  1. Maintain joint width for replacement stone to match existing joints.
  2. Use setting buttons or shims to set stone accurately spaced with uniform joints.

H. Set replacement stone with completely filled bed, head, and collar joints. Butter vertical joints for full width before setting and set into units in full bed of mortar unless otherwise indicated.

1. Tool exposed mortar joints in repaired areas to match rope joints of surrounding existing stonework.
2. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

### **3.6 STONE FRAGMENT REPAIR**

- A. Carefully remove cracked stone fragment indicated to be repaired. Reuse only stone fragment that is in sound condition.
- B. Remove soil, loose particles, mortar, and other debris or foreign material, from fragment surfaces to be bonded and from parent stone where fragment had broken off, by cleaning with stiff-fiber brush.
- C. Pinning of large fragments: Before applying adhesive, prepare for mechanical anchorage consisting of 1/4-inch-diameter, stainless steel pins set into 1/4-inch-diameter holes drilled at 45-degree downward angle through face of fragment and into parent stone. Center and space pins between 3 and 5 inches apart and at least 2 inches from any edge. Insert pins at least 2 inches into parent stone and 2 inches into fragment with end countersunk at least  $\frac{3}{4}$  inch from exposed face of fragment.
- D. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of fragment and parent stone, completely filling all crevices and voids.
- E. Fit stone fragment onto parent stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of fragment with face of parent stone.
- F. Clean adhesive residue from exposed surfaces and patch chipped area and exposed drill holes as specified in "Stone Patching" Article.

### **3.7 EPOXY CRACK FILLER**

- A. Carefully remove soil, loose particles, mortar, and other debris or foreign material which may block crack-filler from penetrating the surface of the crack. Surfaces should be clean and dry or damp.
- B. General: Comply with epoxy crack-filler manufacturer's written instructions.
- C. Cracks should be filled completely, flush with adjacent surfaces.
- D. Clean epoxy crack filler from face of stone before it sets.

### **3.8 STONE PATCHING**

- A. Patch the following stone units unless another type of replacement or repair is indicated:
  - 1. Units indicated to be patched.
  - 2. Units with holes.
  - 3. Units with chipped edges or corners.
  - 4. Units with small areas of deep deterioration.
- B. Remove and replace existing patches unless otherwise indicated or approved by Architect.
- C. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
- D. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of stone unit.
- E. Mix patching compound in individual batches to match each stone unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
- F. Brush-coat stone surfaces with slurry coat of patching compound according to manufacturer's written instructions.
- G. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
  - 1. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.
- H. Keep each layer damp for 72 hours or until patching compound has set.
- I. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

### **3.9 BRICK REMOVAL AND REPLACEMENT**

- A. Cut out mortar joints surrounding brick units that are damaged, spalled, or deteriorated. Carefully demolish or remove entire units from joint to joint, without damaging surrounding masonry, in a manner that permits replacement with full-size units.
  - 1. When removing single bricks, remove material from center of brick and work toward outside edges.

- B. Support and protect remaining masonry that surrounds removal area.  
Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing backup, rotted wood, rusted metal, and other deteriorated items.
- D. Clean bricks surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- E. Replace removed damaged brick with salvaged brick to match existing in appearance and hardness.
- F. Install replacement brick into bonding and coursing pattern of existing brick. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
  - 1. Maintain joint width for replacement units to match existing joints.
  - 2. Use setting buttons or shims to set units accurately spaced with uniform joints.
- G. Lay replacement brick with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption (suction) of more than 30 g/30 sq. in. per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid.
  - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing brickwork.
  - 2. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

### **3.10 RE-ANCHORING VENEERS**

- A. Install masonry repair anchors in horizontal mortar joints and according to manufacturer's written instructions. Install at not more than 16 inches o.c. vertically and 32 inches o.c. horizontally unless otherwise indicated. Install at locations to avoid penetrating flashing.
- B. Recess anchors at least 5/8 inch from surface of mortar joint and fill recess with pointing mortar.

- - - E N D - - -

**SECTION 05 50 00**  
**METAL FABRICATIONS**

**1.1 DESCRIPTION**

- A. This section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.
- B. Items specified.
  - 1. Loose Lintels
  - 2. Railings
  - 3. Metal Stair Treads

**1.2 RELATED WORK**

- A. Prime and finish painting: Section 09 91 00, PAINTING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:

Metal Stair Treads	
--------------------	--

- C. Shop Drawings:
  - 1. Each item specified, showing complete detail, location in the project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.
  - 2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
  - 3. Provide templates and rough-in measurements as required.
- D. Manufacturer's Certificates:
  - 1. Anodized finish as specified.
  - 2. Live load designs as specified.
- E. Design Calculations for specified live loads including dead loads.
- F. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

**1.4 QUALITY ASSURANCE**

- A. Each manufactured product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.
- B. Each product type shall be the same and be made by the same manufacturer.

- C. Assembled product to the greatest extent possible before delivery to the site.
- D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

#### **1.5 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Mechanical Engineers (ASME):
  - B18.6.1-97.....Wood Screws
  - B18.2.2-87(R2005).....Square and Hex Nuts
- C. American Society for Testing and Materials (ASTM):
  - A36/A36M-08.....Structural Steel
  - A47-99(R2009).....Malleable Iron Castings
  - A48-03(R2008).....Gray Iron Castings
  - A53-10.....Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
  - A123-09.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - A167-99(R2009).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
  - A269-10.....Seamless and Welded Austenitic Stainless Steel Tubing for General Service
  - A307-10.....Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
  - A312/A312M-09.....Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
  - A391/A391M-07.....Grade 80 Alloy Steel Chain
  - A653/A653M-10.....Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
  - A786/A786M-09.....Rolled Steel Floor Plate
  - B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
  - B456-03(R2009).....Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
  - B632-08.....Aluminum-Alloy Rolled Tread Plate
  - C1107-08.....Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

- D3656-07.....Insect Screening and Louver Cloth Woven from  
Vinyl-Coated Glass Yarns
- F436-10.....Hardened Steel Washers
- F468-10.....Nonferrous Bolts, Hex Cap Screws, and Studs for  
General Use
- F593-02 (R2008).....Stainless Steel Bolts, Hex Cap Screws, and Studs
- F1667-11.....Driven Fasteners: Nails, Spikes and Staples
- D. American Welding Society (AWS):
  - D1.1-10.....Structural Welding Code Steel
  - D1.2-08.....Structural Welding Code Aluminum
  - D1.3-08.....Structural Welding Code Sheet Steel
- E. National Association of Architectural Metal Manufacturers (NAAMM)
  - AMP 521-01.....Pipe Railing Manual
  - AMP 500-06.....Metal Finishes Manual
  - MBG 531-09.....Metal Bar Grating Manual
  - MBG 532-09.....Heavy Duty Metal Bar Grating Manual
- F. Structural Steel Painting Council (SSPC)/Society of Protective Coatings:
  - SP 1-04.....No. 1, Solvent Cleaning
  - SP 2-04.....No. 2, Hand Tool Cleaning
  - SP 3-04.....No. 3, Power Tool Cleaning
- G. Federal Specifications (Fed. Spec):
  - RR-T-650E.....Treads, Metallic and Nonmetallic, Nonskid

## **PART 2 - PRODUCTS**

### **2.1 DESIGN CRITERIA**

- A. In addition to the dead loads, design fabrications to support the following live loads unless otherwise specified.
- B. Railings and Handrails: 900 N (200 pounds) in any direction at any point.
- C. Design stairs to support a live load of 500 kg/m<sup>2</sup> (100 pounds per square foot).
- D. Structural design, fabrication and assembly in accordance with requirements of NAAMM Metal Stairs Manual, except as otherwise specified or shown.
- E. Design Grating treads in accordance with NAAMM Metal Bar Grating Manual.

### **2.2 MATERIALS**

- A. Structural Steel: ASTM A36.
- B. Steel Pipe: ASTM A53.
  - 1. Galvanized for exterior locations.
  - 2. Type S, Grade A unless specified otherwise.

3. NPS (inside diameter) as shown.

C. Primer Paint: As specified in Section 09 91 00, PAINTING.

D. Grout: ASTM C1107, pourable type.

## **2.3 HARDWARE**

### **A. Rough Hardware:**

1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electro-galvanizing process. Galvanized G-90 where specified.
2. Use G90 galvanized coating on ferrous metal for exterior work unless non-ferrous metal or stainless is used.

### **B. Fasteners:**

1. Bolts with Nuts:
  - a. ASME B18.2.2.
  - b. ASTM A307 for 415 MPa (60,000 psi) tensile strength bolts.
  - c. ASTM F468 for nonferrous bolts.
  - d. ASTM F593 for stainless steel.
2. Screws: ASME B18.6.1.
3. Washers: ASTM F436, type to suit material and anchorage.
4. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

## **2.4 FABRICATION GENERAL**

### **A. Material**

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.
2. Use material free of defects which could affect the appearance or service ability of the finished product.

### **B. Size:**

1. Size and thickness of members as shown.
2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

### **C. Connections**

1. Except as otherwise specified, connections may be made by welding, riveting or bolting.
2. Field riveting will not be approved.
3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.

4. Holes, for rivets and bolts: Accurately punched or drilled and burrs removed.
5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.
6. Use Rivets and bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material will not be approved.
7. Use stainless steel connectors for removable members machine screws or bolts.

D. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.
2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.
3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.
4. Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.
5. Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power actuated drive pins, welding, self drilling and tapping screws or bolts.
6. Where metal fabrications are to be anchored to existing masonry construction, mechanical connections shall occur only within existing mortar joints.

E. Workmanship

1. General:
  - a. Fabricate items to design shown.
  - b. Furnish members in longest lengths commercially available within the limits shown and specified.
  - c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.
  - d. Provide holes, sinkages and reinforcement shown and required for fasteners and anchorage items.

- e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.
  - f. Prepare members for the installation and fitting of hardware.
  - g. Cut openings in gratings and floor plates for the passage of ducts, sumps, pipes, conduits and similar items. Provide reinforcement to support cut edges.
  - h. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.
2. Welding:
- a. Weld in accordance with AWS.
  - b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.
  - c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.
  - d. Finish welded joints to match finish of adjacent surface.
3. Joining:
- a. Miter or butt members at corners.
  - b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.
4. Anchors:
- a. Where metal fabrications are shown to be preset in concrete, weld 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 150 mm (6 inches) long with 25 mm (one inch) hooked end, to back of member at 600 mm (2 feet) on center, unless otherwise shown.
  - b. Where metal fabrications are shown to be built into masonry use 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 250 mm (10 inches) long with 50 mm (2 inch) hooked end, welded to back of member at 600 mm (2 feet) on center, unless otherwise shown.
5. Cutting and Fitting:
- a. Accurately cut, machine and fit joints, corners, copes, and miters.
  - b. Fit removable members to be easily removed.
  - c. Design and construct field connections in the most practical place for appearance and ease of installation.
  - d. Fit pieces together as required.
  - e. Fabricate connections for ease of assembly and disassembly without use of special tools.
  - f. Joints firm when assembled.

- g. Conceal joining, fitting and welding on exposed work as far as practical.
- h. Do not show rivets and screws prominently on the exposed face.
- i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

F. Finish:

- 1. Finish exposed surfaces in accordance with NAAMM Metal Finishes Manual.
- 3. Steel and Iron: NAAMM AMP 504.
  - a. Zinc coated (Galvanized): ASTM A123, G90 unless noted otherwise.
  - b. Surfaces exposed in the finished work:
    - 1) Finish smooth rough surfaces and remove projections.
    - 2) Fill holes, dents and similar voids and depressions with epoxy type patching compound.
  - c. Shop Prime Painting:
    - 1) Surfaces of Ferrous metal:
      - a) Items not specified to have other coatings.
      - b) Galvanized surfaces specified to have prime paint.
      - c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.
      - d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.
      - e) After cleaning and finishing apply one coat of primer as specified in Section 09 91 00, PAINTING.
    - 2) Non ferrous metals: Comply with MAAMM-500 series.

G. Protection:

- 1. Insulate aluminum surfaces that will come in contact with concrete, masonry, plaster, or metals other than stainless steel, zinc or white bronze by giving a coat of heavy-bodied alkali resisting bituminous paint or other approved paint in shop.
- 2. Spot prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc rich paint on hot-dip zinc coat items and zinc dust primer on all other zinc coated items.

**2.5 SUPPORTS - NOT USED**

**2.6 FRAMES - NOT USED**

**2.7 GUARDS - NOT USED**

**2.8 COVERS AND FRAMES FOR PITS AND TRENCHES - NOT USED**

**2.9 GRATINGS - NOT USED**

**2.10 LOOSE LINTELS**

- A. Furnish lintels of sizes shown. Where size of lintels is not shown, provide the sizes specified.
- B. Fabricate lintels with not less than 150 mm (6 inch) bearing at each end for nonbearing masonry walls, and 200 mm (8 inch) bearing at each end for bearing walls.
- C. Provide one angle lintel for each 100 mm (4 inches) of masonry thickness as follows except as otherwise specified or shown.
  - 1. Openings 750 mm to 1800 mm (2-1/2 feet to 6 feet) - 100 x 90 x 8 mm (4 x 3-1/2 x 5/16 inch).
  - 2. Openings 1800 mm to 3000 mm (6 feet to 10 feet) - 150 x 90 x 9 mm (6 x 3-1/2 x 3/8 inch).
- D. For 150 mm (6 inch) thick masonry openings 750 mm to 3000 mm (2-1/2 feet to 10 feet) use one angle 150 x 90 x 9 mm (6 x 3-1/2 x 3/8 inch).
- E. Provide bearing plates for lintels where shown.
- F. Weld or bolt upstanding legs of double angle lintels together with 19 mm (3/4 inch bolts) spaced at 300 mm (12 inches) on centers.
- G. Insert spreaders at bolt points to separate the angles for insertion of metal windows, louver, and other anchorage.
- H. Where shown or specified, punch upstanding legs of single lintels to suit size and spacing of anchor bolts.
- I. Elevator Entrance:
  - 1. Fabricate lintel from plate bent to channel shape, and provide a minimum of 100 mm (4 inch) bearing each end.
  - 2. Cut away the front leg of the channel at each end to allow for concealment behind elevator hoistway entrance frame.

**2.11 SHELF ANGLES - NOT USED**

**2.12 PLATE DOOR SILL - NOT USED**

**2.13 SAFETY NOSINGS - NOT USED**

**2.14 LADDERS - NOT USED**

**2.15 RAILINGS**

- A. In addition to the dead load design railing assembly to support live load specified.
- B. Fabrication General:

1. Provide continuous welded joints, dressed smooth and flush.
2. Standard flush fittings, designed to be welded, may be used.
3. Exposed threads will not be approved.
4. Form handrail brackets to size and design shown.
5. Exterior Post Anchors.
  - a. Fabricate tube or pipe sleeves with closed ends or plates as shown.
  - b. Where inserts interfere with reinforcing bars, provide flanged fittings welded or threaded to posts for securing to concrete with expansion bolts.
  - c. Provide heavy pattern sliding flange base plate with set screws at base of pipe or tube posts. Base plates are not required on pipe sleeves where ornamental railings occur.
6. Interior Post Anchors:
  - a. Provide flanged fittings for securing fixed posts to floor with expansion bolts, unless shown otherwise.
  - b. Weld or thread flanged fitting to posts at base.
  - c. For securing removable posts to floor, provide close fitting sleeve insert or inverted flange base plate with stud bolts or rivets concrete anchor welded to the base plate.
  - d. Provide sliding flange base plate on posts secured with set screws.
  - e. Weld flange base plate to removable posts set in sleeves.

C. Handrails:

1. Close free ends of rail with flush metal caps welded in place except where flanges for securing to walls with bolts are shown.
2. Make provisions for attaching handrail brackets to wall, posts, and handrail as shown.

D. Steel Pipe Railings:

1. Fabricate of steel pipe with welded joints.
2. Number and space of rails as shown.
3. Space posts for railings not over 1800 mm (6 feet) on centers between end posts.
4. Form handrail brackets from malleable iron.
5. Fabricate removable sections with posts at end of section.
6. Removable Rails:
  - a. Provide "U" shape brackets at each end to hold removable rail as shown. Use for top and bottom horizontal rail when rails are joined together with vertical members.

- b. Secure rail to brackets with 9 mm (3/8 inch) stainless steel through bolts and nuts at top rail only when rails joined with vertical members.
  - c. Continuously weld brackets to post.
  - d. Provide slotted bolt holes in rail bracket.
  - e. Weld bolt heads flush with top of rail.
  - f. Weld flanged fitting to post where posts are installed in sleeves.
7. Opening Guard Rails:
- a. Fabricate rails with flanged fitting at each end to fit between wall opening jambs.
  - b. Design flange fittings for fastening with machine screws to steel plate anchored to jambs.
  - c. Fabricate rails for floor openings for anchorage in sleeves.
8. Gates:
- a. Fabricate from steel pipe as specified for railings.
  - b. Fabricate gate fittings from either malleable iron or wrought steel.
  - c. Hang each gate on suitable spring hinges of clamp on or through bolted type. Use bronze hinges for exterior gates.
  - d. Provide suitable stops, so that gate will swing as shown.

**2.16 CATWALKS - NOT USED**

**2.17 TRAP DOOR AND FRAMES WITH CEILING HATCH - NOT USED**

**2.18 SIDEWALK DOOR - NOT USED**

**2.19 SCREENED ACCESS DOORS AND FRAMES - NOT USED**

**2.20 STEEL COUNTER OR BENCH TOP FRAME AND LEGS - NOT USED**

**PART 3 - EXECUTION**

**3.1 INSTALLATION, GENERAL**

- A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Items set into concrete or masonry.
  - 1. Provide temporary bracing for such items until concrete or masonry is set.
  - 2. Place in accordance with setting drawings and instructions.
  - 3. Build strap anchors, into masonry as work progresses.
- C. Set frames of gratings, covers, corner guards, trap doors and similar items flush with finish floor or wall surface and, where applicable, flush with side of opening.

- D. Field weld in accordance with AWS.
  - 1. Design and finish as specified for shop welding.
  - 2. Use continuous weld unless specified otherwise.
- E. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified. Power actuated drive pins may be used except for removable items and where members would be deformed or substrate damaged by their use. Where metal fabrications are to be anchored to existing masonry construction, mechanical connections shall occur only within existing mortar joints.
- F. Spot prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop prime coat with same kind of paint used for shop priming.
- G. Isolate aluminum from dissimilar metals and from contact with concrete and masonry materials as required to prevent electrolysis and corrosion.
- H. Secure escutcheon plate with set screw.

**3.2 INSTALLATION OF SUPPORTS - NOT USED**

**3.3 COVERS AND FRAMES FOR PITS AND TRENCHES - NOT USED**

**3.4 FRAMES FOR LEAD LINED DOORS - NOT USED**

**3.5 DOOR FRAMES - NOT USED**

**3.6 OTHER FRAMES - NOT USED**

**3.7 GUARDS - NOT USED**

**3.8 GRATINGS - NOT USED**

**3.9 STEEL LINTELS**

- A. Use lintel sizes and combinations shown or specified.
- B. Install lintels with longest leg upstanding, except for openings in 150 mm (6 inch) masonry walls install lintels with longest leg horizontal.
- C. Install lintels to have not less than 150 mm (6 inch) bearing at each end for nonbearing walls, and 200 mm (8 inch) bearing at each end for bearing walls.

**3.10 SHELF ANGLES - NOT USED**

**3.11 PLATE DOOR SILL - NOT USED**

**3.12 SAFETY NOSINGS - NOT USED**

**3.13 LADDERS - NOT USED**

**3.14 RAILINGS**

- A. Steel Posts:
  - 1. Secure fixed posts to concrete with expansion bolts through flanged fittings except where sleeves are shown with pourable grout.
  - 2. Install sleeves in concrete formwork.

3. Set post in sleeve and pour grout to surface. Apply beveled bead of urethane sealant at perimeter of post or under flange fitting as specified in Section 07 92 00, JOINT SEALANTS—on exterior posts.
4. Secure removable posts to concrete with either machine screws through flanged fittings which are secured to inverted flanges embedded in and set flush with finished floor, or set posts in close fitting pipe sleeves without grout.
5. Secure sliding flanged fittings to posts at base with set screws.
6. Secure fixed flanged fittings to concrete with expansion bolts.
7. Secure posts to steel with welds.

B. Anchor to Walls:

1. Anchor rails to concrete or solid masonry with machine screws through flanged fitting to steel plate.
  - a. Anchor steel plate to concrete or solid masonry with expansion bolts.
  - b. Anchor steel plate to hollow masonry with toggle bolts.
2. Anchor flanged fitting with toggle bolt to steel support in frame walls.

C. Handrails:

1. Anchor brackets for metal handrails as detailed.
2. Install brackets within 300 mm (12 inches) of return of walls, and at evenly spaced intermediate points not exceeding 1200 mm (4 feet) on centers unless shown otherwise.
3. Expansion bolt to concrete or solid masonry.
4. Toggle bolt to installed supporting frame wall and to hollow masonry unless shown otherwise.

**3.15 CATWALK AND PLATFORMS - NOT USED**

**3.16 SIDEWALK DOOR, TRAP DOORS, AND FRAMES - NOT USED**

**3.17 SCREENED ACCESS DOOR - NOT USED**

**3.18 STEEL COMPONENTS FOR MILLWORK ITEMS - NOT USED**

**3.19 CLEAN AND ADJUSTING**

- A. Adjust movable parts including hardware to operate as designed without binding or deformation of the members centered in the opening or frame and, where applicable, contact surfaces fit tight and even without forcing or warping the components.
- B. Clean after installation exposed prefinished and plated items and items fabricated from stainless steel, aluminum and copper alloys, as recommended by the metal manufacture and protected from damage until completion of the project.

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

09-11

- - - E N D - - -

**SECTION 06 10 00  
ROUGH CARPENTRY**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

Section specifies wood blocking, framing, nailers, rough hardware, and light wood construction.

**1.2 RELATED WORK: NOT APPLICABLE**

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

**1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:**

- A. Protect lumber and other products from dampness both during and after delivery at site.
- B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- C. Stack plywood and other board products so as to prevent warping.
- D. Locate stacks on well drained areas, supported at least 150 mm (6 inches) above grade and cover with well ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

**1.5 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Forest and Paper Association (AFPA):  
National Design Specification for Wood Construction  
NDS-05.....Conventional Wood Frame Construction
- C. American Institute of Timber Construction (AITC):  
A190.1-07.....Structural Glued Laminated Timber
- D. American Society of Mechanical Engineers (ASME):  
B18.2.1-96(R2005).....Square and Hex Bolts and Screws  
B18.2.2-87.....Square and Hex Nuts  
B18.6.1-97.....Wood Screws  
B18.6.4-98(R2005).....Thread Forming and Thread Cutting Tapping Screws  
and Metallic Drive Screws
- E. American Plywood Association (APA):  
E30-07.....Engineered Wood Construction Guide

F. American Society for Testing And Materials (ASTM):

A47-99(R2009).....Ferritic Malleable Iron Castings  
A48-03(R2008).....Gray Iron Castings  
A653/A653M-10.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-  
Iron Alloy Coated (Galvannealed) by the Hot Dip  
Process  
C954-10.....Steel Drill Screws for the Application of Gypsum  
Board or Metal Plaster Bases to Steel Studs from  
0.033 inch (2.24 mm) to 0.112-inch (2.84 mm) in  
thickness  
C1002-07.....Steel Self-Piercing Tapping Screws for the  
Application of Gypsum Panel Products or Metal  
Plaster Bases to Wood Studs or Metal Studs  
D143-09.....Small Clear Specimens of Timber, Method of  
Testing  
D1760-01.....Pressure Treatment of Timber Products  
D2559-10.....Adhesives for Structural Laminated Wood Products  
for Use Under Exterior (Wet Use) Exposure  
Conditions  
D3498-11.....Adhesives for Field-Gluing Plywood to Lumber  
Framing for Floor Systems  
F844-07.....Washers, Steel, Plain (Flat) Unhardened for  
General Use  
F1667-08.....Nails, Spikes, and Staples

G. Federal Specifications (Fed. Spec.):

MM-L-736C.....Lumber; Hardwood

H. Commercial Item Description (CID):

A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self  
Threading Anchors)

I. Military Specification (Mil. Spec.):

MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated

J. Truss Plate Institute (TPI):

TPI-85.....Metal Plate Connected Wood Trusses

K. U.S. Department of Commerce Product Standard (PS)

PS 1-95.....Construction and Industrial Plywood  
PS 20-05.....American Softwood Lumber Standard

## **PART 2 - PRODUCTS**

### **2.1 LUMBER:**

- A. Unless otherwise specified, each piece of lumber bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
  - 1. Identifying marks in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
  - 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Structural Members: Species and grade as listed in the AFPA, National Design Specification for Wood Construction having design stresses as shown.
- C. Lumber Other Than Structural:
  - 1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
  - 2. Framing lumber: Minimum extreme fiber stress in bending of 1100.
  - 3. Furring, blocking, nailers and similar items 100 mm (4 inches) and narrower Standard Grade; and, members 150 mm (6 inches) and wider, Number 2 Grade.
- D. Sizes:
  - 1. Conforming to Prod. Std., PS20.
  - 2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.
- E. Moisture Content:
  - 1. At time of delivery and maintained at the site.
  - 2. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
  - 3. Lumber over 50 mm (2 inches) thick: 25 percent or less.
- F. Fire Retardant Treatment:
  - 1. Mil Spec. MIL-L-19140 with piece of treated material bearing identification of testing agency and showing performance rating.
  - 2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.
- G. Preservative Treatment:
  - 1. Do not treat Heart Redwood and Western Red Cedar.

2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 600 mm (24 inches) from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members used in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with ASTM D1760, except any process involving the use of Chromated Copper arsenate (CCA) for pressure treating wood is not permitted.

## **2.2 PLYWOOD**

- A. Comply with Prod. Std., PS 1.
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- C. Sheathing:
  1. APA rated Exposure 1 or Exterior; panel grade CD or better.

## **2.3 STRUCTURAL-USE PANELS - NOT USED**

## **2.4 ROUGH HARDWARE AND ADHESIVES:**

- A. Anchor Bolts:
  1. ASME B18.2.1 and ANSI B18.2.2 galvanized, 13 mm (1/2 inch) unless shown otherwise.
  2. Extend at least 200 mm (8 inches) into masonry or concrete with ends bent 50 mm (2 inches).
- B. Miscellaneous Bolts: Expansion Bolts: C1D, A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Use 13 mm (1/2 inch) bolt unless shown otherwise.
- C. Washers
  1. ASTM F844.
  2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.
- D. Screws:
  1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
  2. Wood to Steel: ASTM C954, or ASTM C1002.
- E. Nails:
  1. Size and type best suited for purpose unless noted otherwise. Use aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.

2. ASTM F1667:

- a. Common: Type I, Style 10.
- b. Concrete: Type I, Style 11.
- c. Barbed: Type I, Style 26.
- d. Underlayment: Type I, Style 25.
- e. Masonry: Type I, Style 27.
- f. Use special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 32 mm (1-1/4 inches) long, 8d and deformed or annular ring shank.

F. Adhesives:

- 1. For field-gluing plywood to lumber framing floor or roof systems: ASTM D3498.
- 2. For structural laminated Wood: ASTM D2559.

**PART 3 - EXECUTION**

**3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:**

A. Conform to applicable requirements of the following:

- 1. AFPA National Design Specification for Wood Construction for timber connectors.
- 2. AFPA WCD-number 1, Manual for House Framing for nailing and framing unless specified otherwise.
- 3. APA for installation of plywood.

B. Fasteners:

1. Nails.

- a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA Manual for House Framing where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
- b. Use special nails with framing connectors.
- c. Use eight penny or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
- d. Use 16 penny or larger nails for nailing through 50 mm (2 inch) thick lumber.

2. Bolts:

- a. Fit bolt heads and nuts bearing on wood with washers.
- b. Countersink bolt heads flush with the surface of nailers.
- c. Embed in concrete and solid masonry or use expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.

- d. Use toggle bolts to hollow masonry or sheet metal.
- e. Use bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 600 mm (24 inch) intervals between end bolts. Use clips to beam flanges.
- 3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
  - a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
  - b. ASTM C 954 for steel over 0.84 mm (0.033 inch) thick.
- 4. Power actuated drive pins may be used where practical to anchor to solid masonry, concrete, or steel.
- 5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Use metal plugs, inserts or similar fastening.
- 6. Screws to Join Wood:
  - a. Where shown or option to nails.
  - b. ASTM C1002, sized to provide not less than 25 mm (1 inch) penetration into anchorage member.
  - c. Spaced same as nails.
- C. Set sills or plates level in full bed of mortar on masonry or concrete walls.
  - 1. Space anchor bolts 1200 mm (4 feet) on centers between ends and within 150 mm (6 inches) of end. Stagger bolts from side to side on plates over 175 mm (7 inches) in width.
  - 2. Use shims of slate, tile or similar approved material to level wood members resting on concrete or masonry. Do not use wood shims or wedges.
  - 3. Closely fit, and set to required lines.
- D. Cut notch, or bore in accordance with NFPA Manual for House-Framing for passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- E. Blocking Nailers, and Furring:
  - 1. Install furring, blocking, nailers, and grounds where shown.
  - 2. Use longest lengths practicable.
  - 3. Use fire retardant treated wood blocking where shown at openings and where shown or specified.
- 4. Layers of Blocking or Plates:
  - a. Stagger end joints between upper and lower pieces.
  - b. Nail at ends and not over 600 mm (24 inches) between ends.
  - c. Stagger nails from side to side of wood member over 125 mm (5 inches) in width.
- F. Bridging:

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

09-11

1. Use 25 mm by 75 mm (1 inch by 3 inch) lumber with ends beveled for slope. Option: Metal bridging may be used for wood bridging.

- - - E N D - - -

**SECTION 07 60 00  
FLASHING AND SHEET METAL**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

Formed sheet metal work for wall flashing is specified in this section.

**1.2 RELATED WORK**

A. Joint Sealants: Section 07 92 00, JOINT SEALANTS.

**1.3 APPLICABLE PUBLICATIONS**

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.

B. Aluminum Association (AA):

AA-C22A41.....Aluminum Chemically etched medium matte, with  
clear anodic coating, Class I Architectural,  
0.7-mil thick

AA-C22A42.....Chemically etched medium matte, with integrally  
colored anodic coating, Class I Architectural,  
0.7 mils thick

AA-C22A44.....Chemically etched medium matte with  
electrolytically deposited metallic compound,  
integrally colored coating Class I  
Architectural, 0.7-mil thick finish

C. American Architectural Manufacturers Association (AAMA):

AAMA 620.....Voluntary Specification for High Performance  
Organic Coatings on Coil Coated Architectural  
Aluminum

AAMA 621.....Voluntary Specification for High Performance  
Organic Coatings on Coil Coated Architectural  
Hot Dipped Galvanized (HDG) and Zinc-Aluminum  
Coated Steel Substrates

D. ASTM International (ASTM):

A167-99(R2009).....Stainless and Heat-Resisting Chromium-Nickel  
Steel Plate, Sheet, and Strip

A653/A653M-09.....Steel Sheet Zinc-Coated (Galvanized) or Zinc  
Alloy Coated (Galvanized) by the Hot- Dip  
Process

- B32-08.....Solder Metal
- B209-07.....Aluminum and Aluminum-Alloy Sheet and Plate
- B370-09.....Copper Sheet and Strip for Building  
Construction
- D1187-97(R2002).....Asphalt Base Emulsions for Use as Protective  
Coatings for Metal
- D1784-08.....Rigid Poly (Vinyl Chloride) (PVC) Compounds and  
Chlorinated Poly (Vinyl Chloride) (CPVC)  
Compounds
- E. Sheet Metal and Air Conditioning Contractors National Association  
(SMACNA): Architectural Sheet Metal Manual.
- F. National Association of Architectural Metal Manufacturers (NAAMM):  
AMP 500-06.....Metal Finishes Manual
- G. Federal Specification (Fed. Spec):  
A-A-1925A.....Shield, Expansion; (Nail Anchors)  
UU-B-790A.....Building Paper, Vegetable Fiber
- H. International Code Commission (ICC): International Building Code,  
Current Edition

#### **1.4 PERFORMANCE REQUIREMENTS - NOT APPLICABLE**

#### **1.5 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT  
DATA, AND SAMPLES.
- B. Shop Drawings: For all specified items, including:
  - 1. Flashings
- C. Manufacturer's Literature and Data: For all specified items, including:
  - 1. Thru wall flashing
- D. Certificates: Indicating compliance with specified finishing  
requirements, from applicator and contractor.

### **PART 2 - PRODUCTS**

#### **2.1 FLASHING AND SHEET METAL MATERIALS**

- A. Stainless Steel: ASTM A167, Type 302B, dead soft temper.

#### **2.2 FLASHING ACCESSORIES**

- A. Solder: ASTM B32; flux type and alloy composition as required for use  
with metals to be soldered.
- B. Fasteners:
  - 1. Use stainless steel for stainless steel and aluminum alloy.
  - 2. Nails:

- a. Minimum diameter for stainless steel nails: 2 mm (0.095 inch) and annular threaded.
- b. Length to provide not less than 22 mm (7/8 inch) penetration into anchorage.
- C. Sealant: As specified in Section 07 92 00, JOINT SEALANTS for exterior locations.

### **2.3 SHEET METAL THICKNESS**

- A. Except as otherwise shown or specified use thickness or weight of sheet metal as follows:
- B. Concealed Locations (Built into Construction):
  - 1. Stainless steel: 0.25 mm (0.010 inch) thick.
- C. Exposed Locations:
  - 1. Stainless steel: 0.4 mm (0.015 inch).

### **2.4 FABRICATION, GENERAL**

- A. Jointing:
  - 1. In general, stainless steel joints, except expansion and contraction joints, shall be locked and soldered.
  - 2. Jointing of stainless steel over 0.45 mm (0.018 inch) thick shall be done by lapping, riveting and soldering.
  - 3. Joints shall conform to following requirements:
    - a. Flat-lock joints shall finish not less than 19 mm (3/4 inch) wide.
    - b. Lap joints subject to stress shall finish not less than 25 mm (one inch) wide and shall be soldered and riveted.
    - c. Unsoldered lap joints shall finish not less than 100 mm (4 inches) wide.
  - 4. Flat and lap joints shall be made in direction of flow.
  - 5. Soldering:
    - a. Pre tin both mating surfaces with solder for a width not less than 38 mm (1 1/2 inches) of uncoated copper, stainless steel, and copper clad stainless steel.
    - b. Wire brush to produce a bright surface before soldering lead coated copper.
    - c. Treat in accordance with metal producers recommendations other sheet metal required to be soldered.
    - d. Completely remove acid and flux after soldering is completed.

#### **B. Drips:**

1. Form drips at lower edge of sheet metal counter-flashings (cap flashings), fascias, gravel stops, wall copings, by folding edge back 13 mm (1/2 inch) and bending out 45 degrees from vertical to carry water away from the wall.
2. Form drip to provide hook to engage cleat or edge strip for fastening for not less than 19 mm (3/4 inch) loose lock where shown.

C. Edges:

1. Edges of flashings concealed in masonry joints opposite drain side shall be turned up 6 mm (1/4 inch) to form dam, unless otherwise specified or shown otherwise.
2. Finish exposed edges of flashing with a 6 mm (1/4 inch) hem formed by folding edge of flashing back on itself when not hooked to edge strip or cleat. Use 6 mm (1/4 inch) minimum penetration beyond wall face with drip for through-wall flashing exposed edge.

**2.5 FINISHES**

- A. Use same finish on adjacent metal or components and exposed metal surfaces unless specified or shown otherwise.
- B. In accordance with NAAMM Metal Finishes Manual AMP 500, unless otherwise specified.
- C. Finish exposed metal surfaces as follows, unless specified otherwise:
  1. Stainless Steel: Finish No. 2B or 2D.

**2.6 THROUGH-WALL FLASHINGS**

- A. Form through-wall flashing to provide a mechanical bond or key against lateral movement in all directions. Install a sheet having 2 mm (1/16 inch) deep transverse channels spaced four to every 25 mm (one inch), or ribbed diagonal pattern, or having other deformation unless specified otherwise.
  1. Fabricate in not less than 2400 mm (8 feet) lengths; 3000 mm (10 feet) maximum lengths.
  2. Fabricate so keying nests at overlaps.
- B. For Masonry Work When Concealed Except for Drip:
  1. Stainless steel.
  2. Form an integral dam at least 5 mm (3/16 inch) high at back edge.
  3. Form exposed portions of flashing with drip, approximately 6 mm (1/4 inch) projection beyond wall face.
- D. Lintel Flashing:
  1. Use stainless steel.

2. Fabricate flashing at ends with folded corners to turn up 5 mm (3/16 inch) in first vertical masonry joint beyond masonry opening.
3. Turn up back edge as shown.
4. Form exposed portion with drip as specified.

**2.7 BASE FLASHING - NOT APPLICABLE**

**2.8 COUNTERFLASHING (CAP FLASHING OR HOODS) - NOT APPLICABLE**

**2.9 GRAVEL STOPS - NOT APPLICABLE**

**2.10 BITUMEN STOPS - NOT APPLICABLE**

**2.11 HANGING GUTTERS - NOT APPLICABLE**

**2.12 CONDUCTORS (DOWNSPOUTS) - NOT APPLICABLE**

**2.13 SPLASHPANS - NOT APPLICABLE**

**2.14 REGLETS - NOT APPLICABLE**

**2.15 INSULATED EXPANSION JOINT COVERS - NOT APPLICABLE**

**2.16 ENGINE EXHAUST PIPE OR FLUE OR STACK FLASHING - NOT APPLICABLE**

**2.17 SCUPPERS - NOT APPLICABLE**

**2.18 GOOSENECK ROOF VENTILATORS - NOT APPLICABLE**

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

**A. General:**

1. Install flashing and sheet metal items as shown in Sheet Metal and Air Conditioning Contractors National Association, Inc., publication, ARCHITECTURAL SHEET METAL MANUAL, except as otherwise shown or specified.
2. Apply Sealant as specified in Section 07 92 00, JOINT SEALANTS.
3. Apply sheet metal and other flashing material to surfaces which are smooth, sound, clean, dry and free from defects that might affect the application.
4. Remove projections which would puncture the materials and fill holes and depressions with material compatible with the substrate.
5. Coordinate with masonry work for the application of a skim coat of mortar to surfaces of unit masonry to receive flashing material before the application of flashing.
6. Confine direct nailing of sheet metal to strips 300 mm (12 inch) or less wide. Nail flashing along one edge only. Space nail not over 100 mm (4 inches) on center unless specified otherwise.
7. Install bolts, rivets, and screws where indicated, specified, or required in accordance with the SMACNA Sheet Metal Manual. Space

- rivets at 75 mm (3 inch) on centers in two rows in a staggered position. Use neoprene washers under fastener heads when fastener head is exposed.
8. Install flashings in conjunction with other trades so that flashings are inserted in other materials and joined together to provide a water tight installation.
  9. Where required to prevent galvanic action between dissimilar metal isolate the contact areas of dissimilar metal with sheet lead, waterproof building paper, or a coat of bituminous paint.
  10. Isolate aluminum in contact with dissimilar metals others than stainless steel, white bronze or other metal compatible with aluminum by:
    - a. Paint dissimilar metal with a prime coat of zinc-chromate or other suitable primer, followed by two coats of aluminum paint.
    - b. Paint dissimilar metal with a coat of bituminous paint.
    - c. Apply an approved caulking material between aluminum and dissimilar metal.

### **3.2 THROUGH-WALL FLASHING**

#### **A. General:**

1. Install continuous through-wall flashing under masonry as shown.
2. Terminate exterior edge beyond face of wall approximately 6 mm (1/4 inch) with drip edge where not part of counter flashing.
3. Turn back edge up 6 mm (1/4 inch) unless noted otherwise where flashing terminates in mortar joint or hollow masonry unit joint.
4. Terminate interior raised edge in masonry backup unit approximately 38 mm (1 1/2 inch) into unit unless shown otherwise.
5. Lap end joints at least two corrugations, but not less than 100 mm (4 inches). Seal laps with sealant.
6. Where dowels, reinforcing bars and fastening devices penetrate flashing, seal penetration with sealing compound. Sealing compound is specified in Section 07 92 00, JOINT SEALANTS.
7. Coordinate with other work to set in a bed of mortar above and below flashing so that total thickness of the two layers of mortar and flashing are same as regular mortar joint.
8. Where ends of flashing terminate turn ends up 25 mm (1 inch) and fold corners to form dam extending to wall face in vertical mortar or veneer joint.

9. Turn flashing up not less than 200 mm (8 inch) between masonry or behind exterior veneer.
  10. When flashing terminates in reglet extend flashing full depth into reglet and secure with lead or plastic wedges spaced 150 mm (6 inch) on center.
- B. Lintel Flashing when not part of shelf angle flashing:
1. Install flashing full length of lintel to nearest vertical joint in masonry over veneer.
  2. Turn ends up 25 mm (one inch) and fold corners to form dam and extend end to face of wall.
  3. Turn back edge up to top of lintel; terminate back edge as specified for back-up wall.

**3.3 BASE FLASHING - NOT APPLICABLE**

**3.4 COUNTERFLASHING (CAP FLASHING OR HOODS) - NOT APPLICABLE**

**3.5 REGLETS - NOT APPLICABLE**

**3.6 GRAVEL STOPS - NOT APPLICABLE**

**3.7 COPINGS - NOT APPLICABLE**

**3.8 EXPANSION JOINT COVERS, INSULATED - NOT APPLICABLE**

**3.9 ENGINE EXHAUST PIPE OR STACK FLASHING - NOT APPLICABLE**

**3.10 HANGING GUTTERS - NOT APPLICABLE**

**3.11 CONDUCTORS (DOWNSPOUTS) - NOT APPLICABLE**

**3.12 SPLASH PANS - NOT APPLICABLE**

**3.13 GOOSENECK ROOF VENTILATORS - NOT APPLICABLE**

- - - E N D - - -

**SECTION 07 92 00  
JOINT SEALANTS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

Section covers all sealant and caulking materials and their application, wherever required for complete installation of building materials or systems.

**1.2 RELATED WORK:**

A. Glazing: Section 08 80 00, GLAZING.

**1.3 QUALITY CONTROL:**

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
  - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
- D. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates in accordance with sealant manufacturer's recommendations:
  - 1. Locate test joints where indicated or, if not indicated, as directed by Contracting Officer.
  - 2. Conduct field tests for each application indicated below:
    - a. Each type of elastomeric sealant and joint substrate indicated.
  - 3. Notify Resident Engineer seven days in advance of dates and times when test joints will be erected.
- E. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's installation instructions for each product used.
- C. Cured samples of exposed sealants for each color where required to match adjacent material.
- D. Manufacturer's Literature and Data:
  - 1. Caulking compound
  - 2. Primers
  - 3. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

**1.5 PROJECT CONDITIONS:**

- A. Environmental Limitations:
  - 1. Do not proceed with installation of joint sealants under following conditions:
    - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 °C (40 °F).
    - b. When joint substrates are wet.
- B. Joint-Width Conditions:
  - 1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions:
  - 1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

**1.6 DELIVERY, HANDLING, AND STORAGE:**

- A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.
- B. Carefully handle and store to prevent inclusion of foreign materials.
- C. Do not subject to sustained temperatures exceeding 32° C (90° F) or less than 5° C (40° F).

**1.7 DEFINITIONS:**

- A. Definitions of terms in accordance with ASTM C717 and as specified.

- B. Back-up Rod: A type of sealant backing.
- C. Bond Breakers: A type of sealant backing.
- D. Filler: A sealant backing used behind a back-up rod.

**1.8 WARRANTY:**

- A. Warranty exterior sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be extended to two years.
- B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

**1.9 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - C509-06.....Elastomeric Cellular Preformed Gasket and Sealing Material.
  - C612-10.....Mineral Fiber Block and Board Thermal Insulation.
  - C717-10.....Standard Terminology of Building Seals and Sealants.
  - C834-10.....Latex Sealants.
  - C919-08.....Use of Sealants in Acoustical Applications.
  - C920-10.....Elastomeric Joint Sealants.
  - C1021-08.....Laboratories Engaged in Testing of Building Sealants.
  - C1193-09.....Standard Guide for Use of Joint Sealants.
  - C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  - D1056-07.....Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
  - E84-09.....Surface Burning Characteristics of Building Materials.
- C. Sealant, Waterproofing and Restoration Institute (SWRI).  
The Professionals' Guide

**PART 2 - PRODUCTS**

**2.1 SEALANTS:**

A. S-1:

1. ASTM C920, polyurethane or polysulfide.
2. Type M.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 20-40

B. S-2:

1. ASTM C920, polyurethane or polysulfide.
2. Type M.
3. Class 25.
4. Grade P.
5. Shore A hardness of 25-40.

C. S-3:

1. ASTM C920, polyurethane or polysulfide.
2. Type S.
3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-25.
6. Minimum elongation of 700 percent.

D. S-4:

1. ASTM C920 polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-40.

E. S-6:

1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class: Joint movement range of plus 100 percent to minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-20.
6. Minimum elongation of 1200 percent.

**2.2 CAULKING COMPOUND: - NOT USED**

**2.3 COLOR:**

- A. Sealants used with exposed masonry shall match color of mortar joints.

- B. Sealants used with unpainted concrete shall match color of adjacent concrete.
- C. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.
- D. Caulking shall be light gray or white, unless specified otherwise.

**2.4 JOINT SEALANT BACKING:**

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
  - 1. Type C: Closed-cell material with a surface skin.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32° C (minus 26° F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

**2.5 FILLER:**

- A. Mineral fiber board: ASTM C612, Class 1.
- B. Thickness same as joint width.
- C. Depth to fill void completely behind back-up rod.

**2.6 PRIMER:**

- A. As recommended by manufacturer of caulking or sealant material.
- B. Stain free type.

**2.7 CLEANERS-NON POUROUS SURFACES:**

Chemical cleaners acceptable to manufacturer of sealants and sealant backing material, free of oily residues and other substances capable of

staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

### **PART 3 - EXECUTION**

#### **3.1 INSPECTION:**

- A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.
- B. Coordinate for repair and resolution of unsound substrate materials.
- C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

#### **3.2 PREPARATIONS:**

- A. Prepare joints in accordance with manufacturer's instructions and SWRI.
- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
  - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
  - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
    - a. Concrete.
    - b. Masonry.
    - c. Unglazed surfaces of ceramic tile.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.
- C. Do not cut or damage joint edges.
- D. Apply masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
  - 1. Do not leave gaps between ends of sealant backings.

2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions.
  1. Apply primer prior to installation of back-up rod or bond breaker tape.
  2. Use brush or other approved means that will reach all parts of joints.
- F. Take all necessary steps to prevent three sided adhesion of sealants.

### **3.3 BACKING INSTALLATION:**

- A. Install back-up material, to form joints enclosed on three sides as required for specified depth of sealant.
- B. Where deep joints occur, install filler to fill space behind the back-up rod and position the rod at proper depth.
- C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.
- D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.
- E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.
- F. Take all necessary steps to prevent three sided adhesion of sealants.

### **3.4 SEALANT DEPTHS AND GEOMETRY:**

- A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
- B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

### **3.5 INSTALLATION:**

- A. General:
  1. Apply sealants and caulking only when ambient temperature is between 5° C and 38° C (40° and 100° F).
  2. Do not use polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.

3. Do not use sealant type listed by manufacture as not suitable for use in locations specified.
  4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
  5. Avoid dropping or smearing compound on adjacent surfaces.
  6. Fill joints solidly with compound and finish compound smooth.
  7. Tool joints to concave surface unless shown or specified otherwise.
  8. Finish paving or floor joints flush unless joint is otherwise detailed.
  9. Apply compounds with nozzle size to fit joint width.
  10. Test sealants for compatibility with each other and substrate. Use only compatible sealant.
- B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.
- C. Where gypsum board partitions are of sound rated, fire rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.
1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
  2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
  3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
  4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cut-outs to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
  5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

### **3.6 FIELD QUALITY CONTROL:**

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates as recommended by sealant manufacturer:
1. Extent of Testing: Test completed elastomeric sealant joints as follows:

- a. Perform 10 tests for first 300 m (1000 feet) of joint length for each type of elastomeric sealant and joint substrate.
  - b. Perform one test for each 300 m (1000 feet) of joint length thereafter or one test per each floor per elevation.
- B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
- C. Inspect tested joints and report on following:
  1. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
  2. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
  3. Whether sealants filled joint cavities and are free from voids.
  4. Whether sealant dimensions and configurations comply with specified requirements.
- D. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
- E. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.
- F. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### **3.7 CLEANING:**

- A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.
- B. After filling and finishing joints, remove masking tape.
- C. Leave adjacent surfaces in a clean and unstained condition.

**3.8 LOCATIONS:**

A. Exterior Building Joints, Horizontal and Vertical:

1. Metal to Metal: Type S-1, S-2
2. Metal to Masonry or Stone: Type S-1
3. Masonry to Masonry or Stone: Type S-1
4. Stone to Stone: Type S-1
5. Threshold Setting Bed: Type S-1, S-3, S-4
6. Masonry Expansion and Control Joints: Type S-6
7. Wood to Masonry: Type S-1

B. Metal Reglets and Flashings:

1. Flashings to Wall: Type S-6
3. Pipe Penetrations: Type S-6

- - - E N D - - -

**SECTION 08 59 00**  
**WOOD WINDOW RESTORATION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. The restoration of existing wood window systems including repair of the existing windows.
  - 1. Existing wood window interior and exterior paint may contain lead. Comply with applicable regulations, laws and ordinances, as well as requirements of Section 02 83 33.13, LEAD PAINT REMOVAL AND DISPOSAL and Section 09 90 00, PAINTING.
  - 2. Existing wood window caulking and glazing putty may contain asbestos. Comply with all applicable regulations, laws and ordinances regarding removal and disposal of asbestos containing materials.

**1.2 RELATED WORK:**

- A. Glazing requirements for wood windows: Section 08 80 00, GLAZING.
- B. Removal of existing wood window paint finishes: Section 09 90 00, PAINTING; Section 02 83 33.13, LEAD PAINT REMOVAL AND DISPOSAL.
- C. Finishing of existing wood windows to remain: Section 09 90 00, PAINTING.

**1.3 SUBMITTALS**

- A. Samples of each required finish, on 12" long typical window member.
  - 1. Color to be selected by historic architect to match original.
- B. Samples of replacement hardware and accessories to match existing.

**1.4 QUALITY ASSURANCE**

- A. Window restoration and repair to meet standards of the Department of the Interior.
- B. Design intent is for all restoration and repair work to match the original historic window units, including the replacement of any deteriorated window components, hardware and accessories.

**1.5 PROJECT CONDITIONS**

- A. Contractor to protect all interior surfaces adjacent to windows from damage during restoration work. Execute the work so as to interfere as little as possible with normal functioning of the occupants of the building.
- B. Contractor to provide secure, weathertight, temporary closures at windows that have been removed for restoration.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Existing Sash: Restore existing wood sash so that joints are strong and complete; repair surfaces with exterior wood consolidant and filler. Sash determined to be unusable at time of initial inspection will be replaced by approved new milled sash at a predetermined price.
- B. Wood: Clear Ponderosa Pine, vertical grain Douglas Fir, Red Oak, or other suitable fine-grain lumber as required to match existing wood members, that has been kiln-dried to a moisture content of 6 to 12 percent at time of fabrication and is free of visible finger-joints, blue stain, knots, pitch-pockets and surface checks larger than 1/8-inch deep by 2 inches wide.
  - 1. Lumber shall be water-repellant preservative treated after machining in accordance with NWWDA I.S. 4.
- C. Window Balances
  - 1. Existing weights to be balanced. Replace cords (ropes) or springs as required. Install weather-stripping on sides of sash.
    - a. Replace ropes where needed with nylon, 3/8" 1500 lb. test cord.
    - b. Replace sash chain where needed with plated steel, 250 lb. test.
    - c. Added weights to be 2 lb. stackable cast iron 4" sections or pre-sized lead weights.
    - d. Replace sash pulleys where needed with red bronze housing and wheel, with a steel axle, and matched to size and weight used.
  - 2. Hidden balances:
    - a. Non-tilt balances are fit into a ploughed stile of sash and screwed into top and bottom with course-threaded hardened screw.
    - b. Block and tackle balances are made with galvanized casing, one or two high initial tension springs, zinc die-cast pulleys, and stainless steel end mounting clip screwed to jamb board with hardened, coarse-threaded screw.
    - c. Balance spring engineered to weight of the sash.
- D. Fasteners: Comply with NWWDA I.S. 2 for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.

### **2.2 WOOD CONSOLIDANT AND FILLER**

- A. Provide two-component liquid wood consolidant and epoxy putty filler material as manufactured by Abatron, Inc., or approved equal.

1. Wood Consolidant: LiquidWood or approved equal, two-component liquid consolidant for use in restoring structural strength and integrity to deteriorated wood.
2. Wood Filler: WoodEpox or approved equal, two-component epoxy adhesive putty for use in structural and decorative applications for the filling, repairing or extending of deteriorated wood.

### **2.3 GLAZING**

- A. Glass and glazing Materials: Refer to Section 08 80 00, GLAZING for glass and glazing requirements applicable to wood window units.

### **2.4 WEATHERSTRIP**

- A. Spring Bronze Weatherstrip: 008" hemmed spring bronze (brass), 1-1/8" wide, complete with nails, Pemko No. P51B17 or equal.
- B. Foam Tape Weatherstrip: Compressible, self-adhesive, foam tape weatherstrip of polyurethane, PVC, or Neoprene, of width and thickness required for the application.

### **2.5 HARDWARE**

- A. Refinish existing hardware.
- B. Replacement hardware to match existing.

### **2.6 WOOD REPAIR**

- A. All filler shall be exterior rated.
- B. Structural repairs shall be with new component parts, with prior approval by COR.

### **2.7 FINISHES**

- A. Existing Wood Finish: Existing wood to be field finished to match historic finish, as specified in Section 09 90 00, PAINTING. Color to be as selected by historic architect.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Conduct a window-by-window survey to determine existing conditions. Surfaces shall be dry at time of survey.
- B. Identify frame members that require replacement, filling or caulking before work begins.
- C. All unforeseen repairs to existing window members shall be identified and all additional costs approved by COR prior to the commencement of repairs.

### **3.2 EXISTING WINDOW RESTORATION**

- A. Remove all glazing putty and broken glass.
- B. Remove existing window hardware as required for restoration work.

1. Tag, number and catalog each item to assure reinstallation in proper location.
- C. Remove all existing paint and varnish finishes as specified in Section 09 90 00, PAINTING.
- D. Replace broken glass at window lites using glass and glazing accessories to match existing; comply with requirements of Section 08 80 00, GLAZING.
- E. Repair window frames and sash as indicated or required.
  1. Repair, replace, or rebuild all rotted or deteriorated wood features, including, but are not limited to, stiles, rails, muntins, joints, frame, and trim. New work shall match existing profiles or shapes in every respect and shall be flush with existing surfaces.
  2. Repair deteriorated wood through the use of epoxies, Dutchman, and/or replacement with new wood to match the existing appearance.
  3. Sand smooth transitions between repaired or replaced wood and remaining original wood.
- F. Re-point as required and re-putty all existing glazing indicated to remain.
- G. Comply with the requirements of Section 09 90 00, PAINTING for the preparation, treatment, priming and painting of existing wood window surfaces.

### **3.3 APPLICATION OF WOOD CONSOLIDANT AND FILLER**

- A. Prepare deteriorated wood surfaces and apply the specified wood consolidant and filler in strict compliance with manufacturer's written instructions and recommendations. Remove and replace wood members not suitable for restoration and wood consolidant and filler materials, with materials, profiles, etc. to match existing construction.

### **3.4 INSTALLATION**

- A. Installer shall conform to safety regulations as required by federal, state and local laws.
- B. Remove inside stops, parting bead, and sashes. Tag and number each item for reinstallation in proper location. If weights will not be reused, remove them from the jamb weight door. Remove and/or replace pulleys as required. Fill weight pockets with fiberglass insulation. Replace weight door, fill pulley hole, cracks and saw cuts.
- C. Install weather stripping.
- D. Reset window sashes level, plumb, true to line, without warp or rack.
- E. Replace inside stop with screws or nails.

### **3.5 CLEANING**

- A. Clean interior and exterior surfaces promptly after reinstallation of restored window units. Take care to avoid damage to protective coatings and finishes. Remove excess glazing and sealants, dirt, and other substances.

### **3.6 PROTECTION**

- A. Institute and maintain protection and other precautions required through the remainder of construction period to ensure that restored window units will be without damage or deterioration at the time of substantial completion.

### **3.7 REMOVAL**

- A. All debris shall be removed from work site.

- - - E N D - - -

**SECTION 08 71 00**  
**DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Door hardware and related items necessary for complete installation and operation of doors.

**1.2 RELATED WORK**

- A. Caulking: Section 07 92 00 JOINT SEALANTS.
- B. Painting: Section 09 91 00, PAINTING.

**1.3 GENERAL**

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. Provide rated door hardware assemblies where required by most current version of the International Building Code (IBC).
- C. Hardware for Labeled Fire Doors and Exit Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements.
- D. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- E. The following items shall be of the same manufacturer, except as otherwise specified:
  - 1. Mortise locksets.
  - 2. Surface applied overhead door closers.
  - 3. Exit devices.

**1.4 WARRANTY**

- A. Automatic door operators shall be subject to the terms of FAR Clause 52.246-21, except that the Warranty period shall be two years in lieu of one year for all items except as noted below:
  - 1. Locks, latchsets, and panic hardware: 5 years.
  - 2. Door closers and continuous hinges: 10 years.

03-01-12

### 1.5 MAINTENANCE MANUALS

- A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article titled "INSTRUCTIONS", furnish maintenance manuals and instructions on all door hardware. Provide installation instructions with the submittal documentation.

### 1.6 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit 6 copies of the schedule per Section 01 33 23. Submit 2 final copies of the final approved schedules to VAMC Locksmith as record copies (VISN Locksmith if the VAMC does not have a locksmith).

- B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

- C. Samples and Manufacturers' Literature:

1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.

- D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

### **1.7 DELIVERY AND MARKING**

- A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Resident Engineer for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in Resident Engineer's office until all other similar items have been installed in project, at which time the Resident Engineer will deliver items on file to Contractor for installation in predetermined locations on the project.

### **1.8 PREINSTALLATION MEETING**

- A. Convene a preinstallation meeting not less than 30 days before start of installation of door hardware. Require attendance of parties directly affecting work of this section, including Contractor and Installer, Architect, Project Engineer and VA Locksmith, Hardware Consultant, and Hardware Manufacturer's Representative. Review the following:
1. Inspection of door hardware.
  2. Job and surface readiness.
  3. Coordination with other work.
  4. Protection of hardware surfaces.
  5. Substrate surface protection.
  6. Installation.
  7. Adjusting.
  8. Repair.
  9. Field quality control.
  10. Cleaning.

### **1.9 INSTRUCTIONS**

- A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mates, thresholds and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters (e.g., "HW") followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. Keying: All cylinders shall be keyed into existing Medeco Keymark x4 System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Cylinders

03-01-12

shall be 7 pin type. Keying information shall be furnished at a later date by the Resident Engineer.

#### **1.10 COORDINATION AND INSTALLATION**

- A. Prior to the start of the hardware installation, the General Contractor shall schedule and conduct a pre-installation meeting with the hardware supplier and the manufacturer representative whom supplied the commercial locks, the exit devices, the door controls/closers, etc.. The purpose is to coordinate materials and techniques, and sequence complex hardware items and systems installation. Proper and correct installation and adjustment of hardware is to be reviewed. Meeting to convene at least one week prior to commencement of hardware installation and the Owner needs to be notified of date and time. Written documentation of date, attendees and participants is to be provided to architect and owner for record.
- B. Prior to owner's occupancy, the general contractor shall schedule and conduct a post-installation meeting with the hardware supplier and the manufacturer representative who supplied the commercial locks, the exit devices, the door controls/closers, etc. for review of the installation of devices.

#### **1.11 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. American Society for Testing and Materials (ASTM):
- F883-04.....Padlocks
- E2180-07.....Standard Test Method for Determining the  
Activity of Incorporated Antimicrobial Agent(s)  
In Polymeric or Hydrophobic Materials
- C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
- A156.1-06.....Butts and Hinges
- A156.2-03.....Bored and Pre-assembled Locks and Latches
- A156.3-08.....Exit Devices, Coordinators, and Auto Flush  
Bolts

03-01-12

- A156.4-08.....Door Controls (Closers)
- A156.5-01.....Auxiliary Locks and Associated Products
- A156.6-05.....Architectural Door Trim
- A156.8-05.....Door Controls-Overhead Stops and Holders
- A156.12-05 .....Interconnected Locks and Latches
- A156.13-05.....Mortise Locks and Latches Series 1000
- A156.15-06.....Release Devices-Closer Holder, Electromagnetic  
and Electromechanical
- A156.16-08.....Auxiliary Hardware
- A156.17-04 .....Self-Closing Hinges and Pivots
- A156.18-06.....Materials and Finishes
- A156.21-09.....Thresholds
- A156.22-05.....Door Gasketing and Edge Seal Systems
- A156.23-04.....Electromagnetic Locks
- A156.24-03.....Delayed Egress Locking Systems
- A156.25-07 .....Electrified Locking Devices
- A156.26-06.....Continuous Hinges
- A156.28-07 .....Master Keying Systems
- A156.29-07 .....Exit Locks and Alarms
- A156.30-03 .....High Security Cylinders
- A156.31-07 .....Electric Strikes and Frame Mounted Actuators
- D. National Fire Protection Association (NFPA):
  - 80-10.....Fire Doors and Fire Windows
  - 101-09.....Life Safety Code
- E. Underwriters Laboratories, Inc. (UL):
  - Building Materials Directory (2008)

## **PART 2 - PRODUCTS**

### **2.1 BUTT HINGES**

- A. MANUFACTURER: Hager BB1168, minimum 2 ball-bearing.
- B. ANSI A156.1. Provide only three-knuckle hinges, except five-knuckle where the required hinge type is not available in a three-knuckle version (e.g., some types of swing-clear hinges). The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:
  - 1. Exterior Doors: Type A2112/A5112 for doors 900 mm (3 feet) wide or less and Type A2111/A5111 for doors over 900 mm (3 feet) wide.  
Hinges for exterior outswing doors shall have non-removable pins.

03-01-12

Hinges for exterior fire-rated doors shall be of stainless steel material.

C. Provide quantity and size of hinges per door leaf as follows:

1. Doors up to 1210 mm (4 feet) high: 2 hinges.
2. Doors 1210 mm (4 feet) to 2260 mm (7 feet 5 inches) high: 3 hinges minimum.
3. Doors greater than 2260 mm (7 feet 5 inches) high: 4 hinges.
4. Doors up to 900 mm (3 feet) wide, standard weight: 114 mm x 114 mm (4-1/2 inches x 4-1/2 inches) hinges.
5. Doors over 900 mm (3 feet) to 1065 mm (3 feet 6 inches) wide, standard weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
6. Doors over 1065 mm (3 feet 6 inches) to 1210 mm (4 feet), heavy weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
7. Provide heavy-weight hinges where specified.
8. At doors weighing 330 kg (150 lbs.) or more, furnish 127 mm (5 inch) high hinges.

D. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for pivots and hinges other than butts specified above and continuous hinges specified below.

## **2.2 CONTINUOUS HINGES - NOT APPLICABLE**

## **2.3 DOOR CLOSING DEVICES**

A. Closing devices shall be products of one manufacturer for each type specified.

## **2.4 OVERHEAD CLOSERS**

A. MANUFACTURER: LCN 4040/4040H

B. Conform to ANSI A156.4, Grade 1.

C. Closers shall conform to the following:

1. The closer shall have minimum 50 percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
2. Where specified, closer shall have hold-open feature.
3. Size Requirements: Provide multi-size closers, sizes 1 through 6, except where multi-size closer is not available for the required application.
4. Material of closer body shall be forged or cast.

03-01-12

5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
6. Where closers are exposed to the exterior or are mounted in rooms that experience high humidity, provide closer body and arm assembly of stainless steel material.
7. Closers shall have full size metal cover; plastic covers will not be accepted.
8. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, adjustable back-check positioning valve, and adjustable delayed action valve.
9. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy-duty parallel arm fifth screws, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
10. Closer arms or backcheck valve shall not be used to stop the door from overswing, except in applications where a separate wall, floor, or overhead stop cannot be used.
11. Provide parallel arm closers with heavy duty rigid arm.
12. Where closers are to be installed on the push side of the door, provide parallel arm type except where conditions require use of top jamb arm.
13. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
14. All closers shall have a 1 ½" (38mm) minimum piston diameter.

**2.5 FLOOR CLOSERS AND FLOOR PIVOT SETS - NOT APPLICABLE**

**2.6 DOOR STOPS - NOT APPLICABLE**

**2.7 OVERHEAD DOOR STOPS AND HOLDERS - NOT APPLICABLE**

**2.8 FLOOR DOOR HOLDERS - NOT APPLICABLE**

**2.9 LOCKS AND LATCHES**

A. MANUFACTURER: Best Lock

1. Cylindrical and Mortise Lock Set with Medeco 7-pin interchangeable cylindrical cores.

B. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not

03-01-12

less than seven pins. Cylinders for all locksets shall be removable core type. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, cylindrical locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw, unless shorter throw allowed by the door manufacturer's fire label. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.

- C. In addition to above requirements, locks and latches shall comply with following requirements:
1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets shall have lever handles fabricated from cast stainless steel. Provide sectional (lever x rose) lever design matching [Best 15J]. No substitute lever material shall be accepted. All locks and latchsets shall be furnished with 122.55 mm (4-7/8-inch) curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 21mm (7/8-inch) lip-to-center dimension. Lock function F02 shall be furnished with emergency tools/keys for emergency entrance. All lock cases installed on lead lined doors shall be lead lined before applying final hardware finish. Furnish armored fronts for all mortise locks. Where mortise locks are installed in high-humidity locations or where exposed to the exterior on both sides of the opening, provide non-ferrous mortise lock case.
  2. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be series 4000 Grade I. All locks and latchsets shall be furnished with 122.55 mm (4-7/8-inch) curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 21mm (7/8-inch) lip-to-center dimension. Provide lever design to match design selected by Architect or to match existing lever design. Where two turn pieces are specified for lock F76, turn piece on inside knob shall lock and unlock inside knob, and turn

03-01-12

piece on outside knob shall unlock outside knob when inside knob is in the locked position. (This function is intended to allow emergency entry into these rooms without an emergency key or any special tool.)

3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.

**2.10 PUSH-BUTTON COMBINATION LOCKS - NOT APPLICABLE**

**2.11 ELECTROMAGNETIC LOCKS - NOT APPLICABLE**

**2.12 ELECTRIC STRIKES - NOT APPLICABLE**

**2.13 KEYS**

- A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

Locks/Keys	Quantity
Cylinder locks	2 keys each
Cylinder lock change key blanks	100 each different key way
Master-keyed sets	6 keys each
Grand Master sets	6 keys each
Great Grand Master set	5 keys
Control key	2 keys

**2.14 KEY CABINET - NOT APPLICABLE**

**2.15 ARMOR PLATES, KICK PLATES, MOP PLATES AND DOOR EDGING**

- A. Conform to ANSI Standard A156.6.
- B. Provide protective plates as specified below:
  1. Kick plates, mop plates and armor plates of metal, Type J100 series.
  2. Provide kick plates where specified. Kick plates shall be 4" high. Kick plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick plates beveled on all 4 edges (B4E). On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other kick plates to within 6 mm (1/4 inch) of each edge of doors. Kick plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
  3. Kick plates are not required on following door sides:
    - a. Armor plate side of doors;

- b. Exterior side of exterior doors;
- c. Both sides of aluminum entrance doors.

## **2.16 EXIT DEVICES**

- A. MANUFACTURER: Von Duprin
- B. Conform to ANSI Standard A156.3. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have cast satin stainless steel lever handles of design similar to locksets, unless otherwise specified. Provide key cylinders for keyed operating trim and, where specified, cylinder dogging.
- C. Surface vertical rod panics shall only be provided less bottom rod; provide fire pins as required by exit device and door fire labels. Do not provide surface vertical rod panics at exterior doors.
- D. Concealed vertical rod panics shall be provided less bottom rod at interior doors, unless lockable or otherwise specified; provide fire pins as required by exit device and door fire labels. Where concealed vertical rod panics are specified at exterior doors, provide with both top and bottom rods.
- E. Where removable mullions are specified at pairs with rim panic devices, provide mullion with key-removable feature.
- F. At non-rated openings with panic hardware, provide panic hardware with key cylinder dogging feature.
- G. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

## **2.17 FLUSH BOLTS (LEVER EXTENSION) - NOT APPLICABLE**

## **2.18 FLUSH BOLTS (AUTOMATIC)- NOT APPLICABLE**

## **2.19 DOOR PULLS WITH PLATES - NOT APPLICABLE**

## **2.20 PUSH PLATES - NOT APPLICABLE**

## **2.21 COMBINATION PUSH AND PULL PLATES - NOT APPLICABLE**

## **2.22 COORDINATORS**

- A. Conform to ANSI A156.16. Coordinators, when specified for fire doors, shall comply with Underwriters Laboratories, Inc., requirements for fire door hardware. Coordinator may be omitted on exterior pairs of doors where either door will close independently regardless of the position of the other door. Open back strike shall not be used on

03-01-12

labeled doors. Paint coordinators to match door frames, unless coordinators are plated. Provide bar type coordinators, except where gravity coordinators are required at acoustic pairs. For bar type coordinators, provide filler bars for full width and, as required, brackets for push-side surface mounted closers, overhead stops, and vertical rod panic strikes.

## **2.23 THRESHOLDS**

- A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with  $\frac{1}{4}$ -20 stainless steel machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.
- B. At exterior doors and any interior doors exposed to moisture, provide threshold with non-slip abrasive finish.
- C. Provide with miter returns where threshold extends more than 12 mm (0.5 inch) from frame face.

## **2.24 AUTOMATIC DOOR BOTTOM SEAL AND RUBBER GASKET FOR LIGHT PROOF OR SOUND CONTROL DOORS - NOT APPLICABLE**

## **2.25 WEATHERSTRIPS (FOR EXTERIOR DOORS)**

- A. Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length ( $0.000774\text{m}^3/\text{s/m}$ ).

## **2.26 MISCELLANEOUS HARDWARE - NOT APPLICABLE**

## **2.27 PADLOCKS FOR VARIOUS DOORS, GATES AND HATCHES - NOT APPLICABLE**

## **2.28 THERMOSTATIC TEMPERATURE CONTROL VALVE CABINETS - NOT APPLICABLE**

## **2.29 HINGED WIRE GUARDS (FOR WINDOWS, DOORS AND TRANSOMS) AND WIRE PARTITION DOORS - NOT APPLICABLE**

## **2.30 FINISHES**

- A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.
- B. 626 or 630: All surfaces on exterior and interior of buildings, except where other finishes are specified.
- C. Miscellaneous Finishes:
  - 1. Hinges --exterior doors: 626 or 630.

2. Door Closers: Factory applied paint finish. Dull or Satin Aluminum color.
  3. Thresholds: Mill finish aluminum.
  4. Cover plates for floor hinges and pivots: 630.
  5. Other primed steel hardware: 600.
- D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces except where otherwise specified.
- E. Anti-microbial Coating: All hand-operated hardware (levers, pulls, push bars, push plates, paddles, and panic bars) shall be provided with an anti-microbial/anti-fungal coating that has passed ASTM E2180 tests. Coating to consist of ionic silver (Ag<sup>+</sup>). Silver ions surround bacterial cells, inhibiting growth of bacteria, mold, and mildew by blockading food and respiration supplies.

### 2.31 BASE METALS

- A. Apply specified U.S. Standard finishes on different base metals as following:

Finish	Base Metal
652	Steel
626	Brass or bronze
630	Stainless steel

## PART 3 - EXECUTION

### 3.1 HARDWARE HEIGHTS

- A. For existing buildings locate hardware on doors at heights to match existing hardware. The Contractor shall visit the site, verify location of existing hardware and submit locations to VA Resident Engineer for approval.
- B. Hardware Heights from Finished Floor:
1. Exit devices centerline of strike (where applicable) 1024 mm (40-5/16 inches).
  2. Locksets and latch sets centerline of strike 1024 mm (40-5/16 inches).
  3. Deadlocks centerline of strike 1219 mm (48 inches).
  4. Hospital arm pull 1168 mm (46 inches) to centerline of bottom supporting bracket.
  5. Centerline of door pulls to be 1016 mm (40 inches).

03-01-12

6. Push plates and push-pull shall be 1270 mm (50 inches) to top of plate.
7. Push-pull latch to be 1024 mm (40-5/16 inches) to centerline of strike.
8. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

### 3.2 INSTALLATION

- A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. At exterior doors, closers shall be mounted on interior side. Where closers are mounted on doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.

B. Hinge Size Requirements:

Door Thickness	Door Width	Hinge Height
45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)
35 mm (1-3/8 inch) (hollow core wood doors)	Not over 1200 mm (4 feet)	113 mm (4-1/2 inches)

- C. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim and surrounding conditions.
- D. Where new hinges are specified for new doors in existing frames or existing doors in new frames, sizes of new hinges shall match sizes of existing hinges; or, contractor may reuse existing hinges provided hinges are restored to satisfactory operating condition as approved by Resident Engineer. Existing hinges shall not be reused on door openings having new doors and new frames. Coordinate preparation for hinge cut-outs and screw-hole locations on doors and frames.

E. Hinges Required Per Door:

Doors 1500 mm (5 ft) or less in height	2 butts
Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts

03-01-12

Doors over 2280 mm (7 feet 6 inches) high	4 butts
Dutch type doors	4 butts
Doors with spring hinges 1370 mm (4 feet 6 inches) high or less	2 butts
Doors with spring hinges over 1370 mm (4 feet 6 inches)	3 butts

- F. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to concrete, ceramic or quarry floor tile, or solid masonry. Fiber or rawl plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.
- G. After locks have been installed; show in presence of COR that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Medical Center Director along with the bitting list. Also a copy of the invoice shall be sent to the COR for his records.) Installation of locks which do not meet specified keying requirements shall be considered sufficient justification for rejection and replacement of all locks installed on project.

### 3.3 FINAL INSPECTION

- A. Installer to provide letter to VA Resident/Project Engineer that upon completion, installer has visited the Project and has accomplished the following:
1. Re-adjust hardware.
  2. Evaluate maintenance procedures and recommend changes or additions, and instruct VA personnel.
  3. Identify items that have deteriorated or failed.
  4. Submit written report identifying problems.

### 3.4 DEMONSTRATION

- A. Demonstrate efficacy of mechanical hardware and electrical, and electronic hardware systems, including adjustment and maintenance procedures, to satisfaction of Resident/Project Engineer and VA Locksmith.

### 3.5 HARDWARE SETS

- A. Following sets of hardware correspond to hardware symbols shown on drawings. Only those hardware sets that are shown on drawings will be

03-01-12

required. Disregard hardware sets listed in specifications but not shown on drawings.

- B. Hardware Consultant working on a project will be responsible for providing additional information regarding these hardware sets. The numbers shown in the following sets come from BHMA standards.

HW-1

1 Set	Weatherstripping	National Guard
	All other existing hardware to remain.	

HW-2

1 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard
	All other existing hardware to remain.	

HW-3

1 EA	Mechanical Exit Device	Von Duprin
1 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard

HW-4

1 EA	Hold-Open Arm Closer	LCN
1 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard

HW-5

1-1/2 PR	Mortise Butt Hinges	Ives
1 EA	Hold-Open Arm Closer	LCN
1 EA	Exit Device with Exterior	Von Duprin
	Keyed Access Hardware	
1 EA	Threshold	Ives
1 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

03-01-12

HW-6

1-1/2 PR	Mortise Butt Hinges	Ives
1 EA	Hold-Open Arm Closer	LCN
1 EA	Exit Device	Von Duprin
1 EA	Threshold	Ives
1 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard

HW-7

3 PR	Mortise Butt Hinges	Ives
2 EA	Hold-Open Arm Closer	LCN
1 EA	Coordinator	Ives
1 EA	Exit Device with Exterior Keyed Access Hardware	Von Duprin
1 EA	Door Edge Guard w/ Astragal	Air Louvers Inc.
1 EA	Exit Device	Von Duprin
1 EA	Threshold	Ives
2 EA	Kickplate, 4" High	Ives
1 Set	Weatherstripping	National Guard

- - - E N D - - -

9-24-12

**SECTION 08 80 00**  
**GLAZING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies glass, related glazing materials and accessories. Glazing products specified apply to factory or field glazed items.

**1.2 RELATED WORK**

**1.3 LABELS**

A. Temporary labels:

1. Provide temporary label on each light of glass identifying manufacturer or brand and glass type, quality and nominal thickness.
2. Label in accordance with NFRC (National Fenestration Rating Council) label requirements.
3. Temporary labels shall remain intact until glass is approved by COR.

B. Permanent labels:

1. Locate in corner for each pane.
2. Label in accordance with ANSI Z97.1 and SGCC (Safety Glass Certification Council) label requirements.
  - a. Tempered glass.
  - b. Laminated glass or have certificate for panes without permanent label.

**1.4 PERFORMANCE REQUIREMENTS**

A. Building Enclosure Vapor Retarder and Air Barrier:

1. Maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

B. Glass Thickness:

1. Select thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7.
2. Test in accordance with ASTM E 1300.
3. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.

**1.5 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Certificates:

9-24-12

1. Certificate on shading coefficient.
2. Certificate on "R" value when value is specified.
- C. Warranty: Submit written guaranty, conforming to General Condition requirements, and to "Warranty of Construction" Article in this Section.
- D. Manufacturer's Literature and Data:
  1. Glass, each kind required.
  2. Putty, for wood sash glazing.
- E. Samples:
  1. Size: 150 mm by 150 mm (6 inches by 6 inches).
- F. Preconstruction Adhesion and Compatibility Test Report: Submit glazing sealant manufacturer's test report indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Delivery: Schedule delivery to coincide with glazing schedules so minimum handling of crates is required. Do not open crates except as required for inspection for shipping damage.
- B. Storage: Store cases according to printed instructions on case, in areas least subject to traffic or falling objects. Keep storage area clean and dry.
- C. Handling: Unpack cases following printed instructions on case. Stack individual windows on edge leaned slightly against upright supports with separators between each.
- D. Protect laminated security glazing units against face and edge damage during entire sequence of fabrication, handling, and delivery to installation location. Provide protective covering on exposed faces of glazing plastics, and mark inside as "INTERIOR FACE" or "PROTECTED FACE":
  1. Treat security glazing as fragile merchandise, and packaged and shipped in export wood cases with width end in upright position and blocked together in a mass. Storage and handling shall comply with Manufacturer's directions and as required to prevent edge damage or other damage to glazing resulting from effects of moisture, condensation, temperature changes, direct exposure to sun, other environmental conditions, and contact with chemical solvents.

2. Temporary protections: The glass front and polycarbonate back of glazing shall be temporarily protected with compatible, peelable, heat-resistant film which will be peeled for inspections and re-applied and finally removed after doors and windows are installed at destination. Since many adhesives will attack polycarbonate, the film used on exposed polycarbonate surfaces shall be approved and applied by manufacturer.
3. Edge protection: To cushion and protect glass clad, polycarbonate, and Noviflex edges from contamination or foreign matter, the four edges shall be sealed the depth of glazing with continuous standard-thickness Santoprene tape. Alternatively, continuous channel shaped extrusion of Santoprene shall be used, with flanges extending into face sides of glazing.

#### **1.7 PROJECT CONDITIONS**

Field Measurements: Field measure openings before ordering tempered glass products. Be responsible for proper fit of field measured products.

#### **1.8 WARRANTY**

A. Warranty: Conform to terms of "Warranty of Construction", FAR clause 52.246-21.

1. Laminated glass units to remain laminated for 5 years.

#### **1.9 APPLICABLE PUBLICATIONS**

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. American National Standards Institute (ANSI):

Z97.1-09.....Safety Glazing Material Used in Building -  
Safety Performance Specifications and Methods  
of Test.

C. American Society for Testing and Materials (ASTM):

C1036-06.....Flat Glass

C1048-12.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated  
and Uncoated Glass.

E84-10.....Surface Burning Characteristics of Building  
Materials

E119-10.....Standard Test Methods for Fire Test of Building  
Construction and Material

9-24-12

D. Commercial Item Description (CID):

A-A-59502.....Plastic Sheet, Polycarbonate

E. Code of Federal Regulations (CFR):

16 CFR 1201 - Safety Standard for Architectural Glazing Materials; 2010

F. National Fire Protection Association (NFPA):

80-13.....Fire Doors and Windows.

252-12.....Standard Method of Fire Test of Door Assemblies

257-12.....Standard on Fire Test for Window and Glass

Block Assemblies

G. National Fenestration Rating Council (NFRC)

H. Safety Glazing Certification Council (SGCC) 2012:

Certified Products Directory (Issued Semi-Annually).

I. Underwriters Laboratories, Inc. (UL):

752-11.....Bullet-Resisting Equipment.

J. Unified Facilities Criteria (UFC):

4-010-01-2012.....DOD Minimum Antiterrorism Standards for

Buildings

K. Glass Association of North America (GANA):

Glazing Manual (Latest Edition)

Sealant Manual (2009)

L. American Society of Civil Engineers (ASCE):

ASCE 7-10.....Wind Load Provisions

**PART 2 - PRODUCT**

**2.1 GLASS**

A. Use thickness stated unless specified otherwise in assemblies.

B. Clear Glass:

1. ASTM C1036, Type I, Class 1, Quality q4.

2. Thickness, 6 mm (1/4 inch).

**2.2 HEAT-TREATED GLASS - NOT USED**

**2.3 COATED GLASS - NOT USED**

**2.4 PLASTIC - NOT USED**

**2.5 LAMINATED GLASS**

A. Two or more lites of glass bonded with an interlayer material for use  
in building glazing

B. Colored Interlayer:

1. Use color interlayer ultraviolet light color stabilization.

9-24-12

2. Option: Use colored interlayer with clear glass in lieu of tinted glass and clear interlayer. Color to be selected by Architect and VA.
  3. The interlayer assembly shall have uniform color presenting same appearance as tinted glass assembly.
- C. Use 1.5 mm (0.060 inch) thick interlayer for:
1. Horizontal or Sloped glazing.
  2. Acoustical glazing.
  3. Heat strengthened or fully tempered glass assemblies.
- D. Use min. 0.75 mm (0.030 inch) thick interlayer for vertical glazing where 1.5 mm (0.060 inch) interlayer is not otherwise shown or required.

**2.6 LAMINATED GLAZING ASSEMBLIES - NOT USED**

**2.7 BULLET RESISTIVE ASSEMBLY - NOT USED**

**2.8 GLASS CLAD POLYCARBONATE SECURITY GLAZING ASSEMBLY - NOT USED**

**2.9 INSULATING GLASS UNITS - NOT USED**

**2.10 FIRE RESISTANT GLASS WITHOUT WIRE MESH - NOT USED**

**2.11 SWITCHABLE PRIVACY GLASS - NOT USED**

**2.12 INSULATING PLASTIC SHEETS - NOT USED**

**2.13 GLAZING ACCESSORIES**

- A. As required to supplement the accessories provided with the items to be glazed and to provide a complete installation. Ferrous metal accessories exposed in the finished work shall have a finish that will not corrode or stain while in service.
- B. Setting Blocks: ASTM C864:
1. Channel shape; having 6 mm (1/4 inch) internal depth.
  2. Shore a hardness of 80 to 90 Durometer.
  3. Block lengths: 50 mm (two inches) except 100 to 150 mm (four to six inches) for insulating glass.
  4. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.
  5. Block thickness: Minimum 4.8 mm (3/16 inch). Thickness sized for rabbet depth as required.
- C. Spacers: ASTM C864:
1. Channel shape having a 6 mm (1/4 inch) internal depth.
  2. Flanges not less 2.4 mm (3/32 inch) thick and web 3 mm (1/8 inch) thick.

9-24-12

3. Lengths: One to 25 to 76 mm (one to three inches).

4. Shore a hardness of 40 to 50 Durometer.

D. Sealing Tapes:

1. Semi-solid polymeric based material exhibiting pressure-sensitive adhesion and withstanding exposure to sunlight, moisture, heat, cold, and aging.

2. Shape, size and degree of softness and strength suitable for use in glazing application to prevent water infiltration.

E. Spring Steel Spacer: Galvanized steel wire or strip designed to position glazing in channel or rabbeted sash with stops.

F. Glazing Clips: Galvanized steel spring wire designed to hold glass in position in rabbeted sash without stops.

G. Glazing Points (Sprigs): Pure zinc stock, thin, flat, triangular or diamond shaped pieces, 6 mm (1/4 inch) minimum size.

H. Glazing Gaskets: ASTM C864:

1. Firm dense wedge shape for locking in sash.

2. Soft, closed cell with locking key for sash key.

3. Flanges may terminate above the glazing-beads or terminate flush with top of beads.

I. Lock-Strip Glazing Gaskets: ASTM C542, shape, size, and mounting as indicated.

J. Glazing Sealants: ASTM C920, silicone neutral cure:

1. Type S.

2. Class 25

3. Grade NS.

4. Shore A hardness of 25 to 30 Durometer.

K. Color:

1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames shall match color of the finished aluminum and be nonstaining.

2. Color of other glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted shall be black, gray, or neutral color.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

A. Verification of Conditions:

1. Examine openings for glass and glazing units; determine they are proper size; plumb; square; and level before installation is started.
  2. Verify that glazing openings conform with details, dimensions and tolerances indicated on manufacturer's approved shop drawings.
- B. Advise Contractor of conditions which may adversely affect glass and glazing unit installation, prior to commencement of installation: Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Verify that wash down of adjacent masonry is completed prior to erection of glass and glazing units to prevent damage to glass and glazing units by cleaning materials.

### **3.2 PREPARATION**

- A. For sealant glazing, prepare glazing surfaces in accordance with GANA-02 Sealant Manual.
- B. Determine glazing unit size and edge clearances by measuring the actual unit to receive the glazing.
- C. Shop fabricate and cut glass with smooth, straight edges of full size required by openings to provide GANA recommended edge clearances.
- D. Verify that components used are compatible.
- E. Clean and dry glazing surfaces.
- F. Prime surfaces scheduled to receive sealants, as determined by preconstruction sealant-substrate testing.

### **3.3 INSTALLATION - GENERAL**

- A. Install in accordance with GANA-01 Glazing Manual and GANA-02 Sealant Manual unless specified otherwise.
- B. Glaze in accordance with recommendations of glazing and framing manufacturers, and as required to meet the Performance Test Requirements specified in other applicable sections of specifications.
- C. Set glazing without bending, twisting, or forcing of units.
- D. Do not allow glass to rest on or contact any framing member.
- E. Glaze doors in a securely fixed or closed and locked position, until sealant, glazing compound, or putty has thoroughly set.
- F. Laminated Glass:
  1. Tape edges to seal interlayer and protect from glazing sealants.
  2. Do not use putty or glazing compounds.

9-24-12

**3.4 INSTALLATION - DRY METHOD (TAPE AND GASKET SPLINE GLAZING) - NOT USED**

**3.5 INSTALLATION - WET/DRY METHOD (PREFORMED TAPE AND SEALANT) - NOT USED**

**3.6 INSTALLATION - WET METHOD (SEALANT AND SEALANT) - NOT USED**

**3.7 INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY) - NOT USED**

**3.8 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT) - NOT USED**

**3.9 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND) - NOT USED**

**3.10 INSTALLATION - REGLAZING HISTORIC FRAMING**

A. Wood Sash: For glazing with glazing beads: Tape or ASTM C920, gunnable sealant.

B. Lock-strip Gaskets: Follow ASTM C716 for installation.

**3.11 REPLACEMENT AND CLEANING**

A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by COR.

B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.

C. Leave glass, putty, and other setting material in clean, whole, and acceptable condition.

**3.12 PROTECTION**

Protect finished surfaces from damage during erection, and after completion of work. Strippable plastic coatings on colored anodized finish are not acceptable.

**3.13 GLAZING SCHEDULE**

A. Laminated Glass: Install as specified in doors, observation windows and interior pane of dual glazed windows where indicated.

- - - E N D - - -

**SECTION 09 90 00**  
**PAINTING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes surface preparation and field painting of exposed exterior items and surfaces as indicated.
- B. Work includes painting and finishing of exterior exposed items and surfaces throughout project, except as otherwise indicated including but not limited to:
1. Paint finishes on new and existing wood siding, moldings, trim, and other items as indicated.
  2. Repainting of Interior and Exterior Restored Wood Windows and Trim.
  3. Repainting architectural decorative metal and miscellaneous incidental metal.
  4. This Section also includes Historic Paint color investigation.
  5. Note: work of this section includes surface preparation, priming and finish coats of paint specified for new and existing surfaces as indicated.
  6. Note: Surface preparation may include the preparation of existing surfaces containing lead based paint in compliance with all applicable codes and regulations.
  7. Note: The work will include providing the paint sheen and multiple custom colors for various siding, trims, window and door surfaces, to be determined and as selected by the Architect based on analysis of Historic Paint Samples.
- C. Related work includes rough and finish carpentry components to receive water repellent preservative and back-priming prior to assembly.
- D. All new surfaces and existing surfaces to be patched or receive other work, that are exposed to view, shall be completely finished (or refinished) along the entire surface; from corner to corner.
- E. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the

item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

F. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

### **1.3 DEFINITIONS**

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
  2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
  3. Semi-gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
  4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

### **1.4 SUBMITTALS**

- A. Product Data: For each paint system indicated. Include primers.
1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
  2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
  3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- B. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
3. Submit three Samples on the following substrates for Architect's review of color and texture only:
  - a. Painted Wood: 8-inch- square Samples for each color and material on hardboard.

C. Qualification Data: For Applicator.

#### **1.5 QUALITY ASSURANCE**

- A. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.
- B. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
    - a. Other Items: Architect will designate items or areas required.
  2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
  3. Final approval of color selections will be based on benchmark samples.
    - a. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  1. Product name or title of material.
  2. Product description (generic classification or binder type).
  3. Manufacturer's stock number and date of manufacture.
  4. Contents by volume, for pigment and vehicle constituents.
  5. Thinning instructions.
  6. Application instructions.
  7. Color name and number.

8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

#### **1.7 PROJECT CONDITIONS**

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.

C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

### **PART 2 - PRODUCTS**

#### **2.1 PAINT REMOVAL MANUFACTURES**

A. 3M Consumer Products Group

Box 33053

St. Paul, MN 55133-3053

612/737-6501 or 800/364-3577

B. Specialty Environmental Technologies, Inc.

4520 Glenmeade Lane

Auburn Hills, MI 48326

810/340-0400

#### **2.2 PAINT MANUFACTURERS**

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Benjamin Moore & Co. (Benjamin Moore).

#### **2.3 PAINT REMOVAL MATERIALS, GENERAL**

- A. Commercial Paint and Varnish Remover such as "Citristrip" (Specialties Environmental Technologies, Inc.), "Safest Stripper" (3M), or approved equal.
- B. Mineral Spirits:
  - 1. A petroleum distillate that is used especially as paint or varnish thinner.
  - 2. Other chemical or common names include Benzine\* (not Benzene); Naphtha\*; Petroleum spirits\*; Solvent naphtha\*.
  - 3. Potential Hazards: TOXIC AND FLAMMABLE.
  - 4. Safety Precautions:
    - a. AVOID REPEATED OR PROLONGED SKIN CONTACT.
    - b. ALWAYS wear rubber gloves when handling mineral spirits.
    - c. If any chemical is splashed onto the skin, wash immediately with soap and water.
- C. Turpentine:
  - 1. Typically used as a solvent and thinner.
  - 2. Potential Hazards: TOXIC AND FLAMMABLE.
  - 3. Safety Precautions:
    - a. Work in a well ventilated area.
    - b. Observe safety rules as turpentine is flammable, and the fumes can trip an ionization smoke detection system.
    - c. Store soiled cloths in a metal safety container to guard against spontaneous combustion.
- D. Equipment
  - 1. 000 steel wool.
  - 2. Steel or brass wire brushes.
  - 3. Stiff fiber bristle brushes.
  - 4. Putty knife or broad knife.
  - 5. Scrapers: Use scrapers of a variety of sizes and shapes as dictated by the surface detail encountered.
  - 6. Clean, dry cloths (cheese cloth or gauze).
  - 7. Nylon web scrubbing pads.

## **2.4 PAINT MATERIALS, GENERAL**

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: As selected by Architect from manufacturer's full range.

## **2.5 EXTERIOR PRIMERS**

A. Exterior Wood Primer for Acrylic Enamels: Factory-formulated alkyd or latex wood primer for exterior application.

1. Benjamin Moore; Moorwhite Primer No. 100: Applied at a dry film thickness of not less than 2.1 mils.

B. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.

1. Benjamin Moore; IronClad Alkyd Low Lustre Metal & Wood Enamel No. 163: Applied at a dry film thickness of not less than 1.3 mils.

C. Exterior Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.

1. Benjamin Moore; IronClad Latex Low-Lustre Metal & Wood Enamel No. 363: Applied at a dry film thickness of not less than 1.6 mils.

## **2.6 EXTERIOR FINISH COATS**

A. Exterior Semigloss (Satin) Acrylic Enamel: Factory-formulated semigloss waterborne acrylic-latex enamel for exterior application.

1. Benjamin Moore; MoorGlo Latex House & Trim Paint No. 096: Applied at a dry film thickness of not less than 1.2 mils.

B. Ferrous Metal: Provide the following finish systems over ferrous metal surfaces:

1. Alkyd Gloss Finish: Two finish coats over a primer.

a. Primer: Devguard 4160 Multi-Purpose Tank & Structural Primer.

b. Finish Coats: Devshield 4308 Alkyd Gloss Enamel.

c. Or equivalent products of listed manufacturers.

## **2.7 INTERIOR PRIMERS/SEALERS**

- A. Interior Wood Primer Sealer for Acrylic Enamels: Factory-formulated Water-Based Acrylic multi-purpose bonding primer for Interior/Exterior application; MPI #6, 17, 39, 137.
- B. Interior/Exterior Metal Primer: Factory-formulated high solids, rust-inhibitive, interior-exterior metal primer.

## **2.8 INTERIOR FINISH COATS**

- A. Interior Semi-Gloss Acrylic Enamel: Factory-formulated Premium wall and trim semi-gloss Acrylic Enamel; MPI #54.

## **2.9 RELATED MATERIALS**

- A. Sealant materials: provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.
  - 1. Acrylic-emulsion sealant: provide product complying with ASTM C 834 that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.
    - a. Available products: subject to compliance with requirements, latex joint sealants that may be incorporated in the work include, but are not limited to, the following:
      - 1) "AC -20," Pecora Corp.
      - 2) "Sonolac," Sonneborn Building Products Div., Chemrex, Inc.
      - 3) "Tremco Acrylic Latex 834," Tremco, Inc.
      - 4) "SikaFlex" (Sika Corporation),
      - 5) or other approved durable, flexible sealant that bonds well with the combination of latex and alkyd paints.
- B. Water repellent preservative: Provide waterborne, paintable, water repellent preservative, formulated to provide protection against mildew, decay, rot, and stain, and to reduce swelling, warping and checking.
  - 1. Products: Subject to compliance with requirements, provide one of the products of the following manufacturers as indicated in the paint schedules.
    - a. DAP Inc.
      - 2400 Boston St.
      - Baltimore, MD 21224

888-327-8477

800-322-3195

b. or approved equal.

C. Exterior Cleaning Solution Materials:

1. Water.
2. Household Bleach.
3. "Jomax"; Zehrung, Chemrad Division, or approved equal.

**PART 3 - EXECUTION**

**3.1 HISTORIC PAINT COLOR INVESTIGATION**

- A. Provide revels or exposure windows as required to determine the original paint color and sheen, using appropriate chemical solvent, paint remover and/or mechanical technique.
  1. Provide a written description of the investigation method/technique to the Architect for review and approval prior to conducting the investigation.
- B. Provide documentation prior to the start of paint removal work to the Architect for review and approval prior to beginning removal and refinishing work. Documentation to include:
  1. Paint color and sheen inventory.

**3.2 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
  1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
  2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
  1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

**3.3 PREPARATION**

- A. Protection:
  1. General: Comply with recommendations of manufacturers of paint strippers for protecting surrounding building surfaces against damage from exposure to their products.

2. Protect adjacent surfaces, including grass, shrubs and trees with paper, drop cloths and other means. Items not painted which are in contact with or adjacent to painted surfaces shall be removed or protected prior to surface preparation and painting operations.
  3. All waste material shall be collected at the end of each work day and disposed of in a manner consistent with local environmental regulations. It is considered Hazardous Waste.
  4. Work area shall be sealed to prevent the spread of paint dust and debris beyond the work site.
  5. All rags shall be disposed of nightly and removed from the building.
  6. Adequate ventilation should be provided in each area where solvents and strippers are used.
  7. A fully charged fire extinguisher suitable for solvent fires shall be kept in each area where work is going on.
  8. Contractor shall provide multiple fans with high CFM to move fumes out of the building and away from areas where work is being done.
  9. Compressor motors, heat lamps, etc., must be of explosion proof type.
  10. No spraying of solvents or strippers permitted unless specifically allowed by the manufacturer of the product being used.
  11. After paint removal is complete, all areas around the site shall be cleaned of all paint dust and debris, and such debris shall be properly disposed of in a manner consistent with local environmental regulations. Vacuums used to clean up dust shall be equipped with High Efficiency Particulate Air (HEPA) filters.
- B. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- C. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

D. Removal of Existing Non-Lead Based Paint Materials in Preparation for Repainting:

1. If the limited lead based paint survey indicates lead based paint, requiring regulated treatment is not present, paint removal may be accomplished by the following approved methods:
  - a. Mechanical methods including dry scraping, sanding, or wire brushing.  
Use methods to limit dust debris.
  - b. Heat guns and scraping of softened paint materials.
  - c. Methods indicated below for removal of Lead Based Paint Materials.

E. Removal of Existing Lead Based Paint Materials in Preparation for Repainting:

1. Where Lead Based Paint is indicated, avoid heat, mechanical, or abrasive techniques, as well as dry scraping, as the methods generate either lead fumes or excessive amounts of lead dust.
2. If the limited lead based paint survey indicates lead based paint, requiring regulated treatment is present, paint removal may be accomplished by the following approved methods:
  - a. Wet Mechanical Methods: Existing item preparation shall be wet scraping, sanding or wire brushing.
    - 1) Place a sheet of 6-mil polyethylene beneath the work area prior to preparation commencement.
    - 2) The debris generated must be collected and disposed in air tight, scalable containers as hazardous waste.
    - 3) Any visible debris shall again be vacuumed using a HEPA filtered vacuum. Any visible dust shall be wet wiped using a 5-10% solution of tri-sodium phosphate.
    - 4) All items shall be removed from the jobsite on a daily basis and placed in a locked dumpster for disposal.
  - b. Chemical Methods (using Alternative Based Strippers):
    - 1) Surface Preparation: Use scrapers of a variety of sizes and shapes, whose edges have been rounded, to remove loose paint before removal using chemicals.
    - 2) Apply chemical stripper using a brush or roller. Follow manufacturer's instructions.
    - 3) Allow stripper to stand for length of time as recommended by manufacturer, depending upon the number of surface layers to be stripped; if necessary, cover with plastic sheeting to keep the stripper moist.

- 4) Using a broad knife or scraper, remove paint and stripper from the surface.
  - 5) Safely dispose of paint and stripper residue. Follow EPA regulations for disposal of lead-base paint.
  - 6) Specifically for varnish buildup:
    - a) Wet steel wool with solvent and rub over the wood surface to remove varnish buildup and to smooth out any checks in the surface.
    - b) Replace steel wool frequently with clean, and continue the wiping process until a smooth surface is achieved.
  - 7) NOTE: DO NOT USE WATER ON THE WOOD SURFACE.
  - 8) Wipe wood with a clean cloth soaked in mineral spirits to remove chemical residue or other method as recommended by the chemical stripper manufacturer.
  - 9) Allow to dry and dry-brush loose material from the surface using a short fiber bristle brush.
  - 10) Repeat as necessary to sufficiently remove the previous coating.
- F. Surface Preparation (General): Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and reprime.
- G. Exterior Painting Preparation and Procedures for Existing Wood: Following the completion of all indicated repairs and renovations to the exterior, complete the following work in preparation for painting:
1. Secure all loose siding and trim using proper nailing materials and methods.
  2. Set all existing popped and new nails, and fill.
  3. Remove all loose or split caulking, putty, fillers and glazing compound.
  4. Scrape, wire brush, and/or sand all loose, chipped and peeling paint; providing smooth, even and solidly adhering substrate. Sand as necessary to remove shoulders at edges of sound paint and provide smooth wood surfaces.
    - a. Use only appropriate methods, as may be required to comply with requirements for preparation of Lead Based Paint Material surfaces.
  5. Dust off surfaces and wipe with mineral spirits.

6. If mildew or fungal growth is present thoroughly wash all surfaces before painting. Use the following procedures for the removal of mildew and fungal growth.
  - a. Mix a cleaning solution of the following proportions:
    - 1) 2 Gallons of water.
    - 2) 3 Pints of Household Bleach.
    - 3) 1 Pint of "Jomax".
  - b. Coverage: 5 gallons of this solution will cover approximately 1,000 square feet of wall surface.
  - c. Place the above solution using a hand sprayer.
  - d. Spray wall surface and allow to stand for 5 minutes. (Heavy staining may require light brushing.)
  - e. Rinse with a garden hose sprayer, angled downward. (Do not use upward spraying or a power sprayer.)
7. Water repellent preservative: Apply water repellent preservative that is compatible with primer and finish paint coats, according to manufacturer's written instructions.
  - a. New wood: Apply water repellent preservative to all surfaces of new wood, prior to installation, by dipping, or if not possible by liberally brushing the entire piece, including ends. Repeat brush treatments to point of refusal. If material is further cut or worked after treatment, retreat finish cuts prior to priming and installation.
  - b. Existing Wood: Apply water repellent preservative to all bare wood surfaces.
  - c. After allowing water repellent preservative to dry as per manufacturer's requirements, prime all edges, ends, faces, undersides, and backsides of wood.
8. Reset all exposed nail heads and treat with rust-inhibiting primer. Penatrol may be added to the primer to aid in preventing oxidation of old nail heads.
9. Caulk all cracks and joints. Provide small bead of sealant at juncture of all siding and trim. Prepare field installation sample of each type of condition for approval by the architect before proceeding with the work.
- H. Exterior Painting Preparation and Procedures for New Wood: Complete the following work in preparation for painting:

1. Water repellent preservative: Apply water repellent preservative that is compatible with primer and finish paint coats, according to manufacturer's written instructions.
  - a. New wood: Apply water repellent preservative to all surfaces of new wood, prior to installation, by dipping, or if not possible by liberally brushing the entire piece, including ends. Repeat brush treatments to point of refusal. If material is further cut or worked after treatment, retreat finish cuts prior to priming and installation.
  - b. After allowing water repellent preservative to dry as per manufacturer's requirements, prime all edges, ends, faces, undersides, and backsides of wood.
2. Following installation; set all nails, and fill.
3. Caulk all cracks and joints. Provide small bead of sealant at juncture of all siding and trim. Prepare field installation sample of each type of condition for approval by the architect before proceeding with the work.
4. Spot prime following filling, puttying, and caulking.
- I. Preparation Procedures for Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
  1. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
  2. Adjacent non-metal surfaces must be protected to ensure that no damage occurs from blast cleaning of metal surfaces.
  3. All areas of existing paint failed by rusting, peeling, blistering, shall be blast, mechanically cleaned, or wire brushed and scraped to remove all loose or loosely adhering material. All well adhered surfaces shall be sanded to scuff glossy surfaces.
  4. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
- J. Preparation Procedures for Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- K. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

### **3.4 APPLICATION**

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
  2. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.
  3. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  4. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  5. Provide finish coats that are compatible with primers used.
  6. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
  2. Omit primer over metal surfaces that have been shop primed and touchup painted.
  3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying.  
Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
  1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
  2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
  3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Open window sash for painting; all sash edges and frame surfaces this exposed shall be painted. Leave sash open until paint is dry. Operate sash through full range of travel after paint is dry to ensure free operation; remove excess paint and repaint if required.
- E. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- F. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- H. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### **3.5 CLEANING**

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
  - 1. After completing painting, clean glass and paint-spattered surfaces.  
Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

### **3.6 PROTECTION**

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
  - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### **3.7 EXTERIOR PAINT SCHEDULE**

- A. Incidental Metal: Provide the following finish systems over incidental exterior metal.
  - 1. Semi-Gloss, Acrylic-Enamel Finish: 2 finish coats over a rust-inhibitive primer.
    - a. Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils.
      - 1) Devoe: 4160 Series Devguard Multi-purpose Metal Primer.
    - b. First and Second Finish Coats: Same as wood window and trim finish.
- B. Exterior Wood (Windows and Trim): Provide the following finish systems over exterior wood:
  - 1. Semigloss Acrylic-Enamel Finish: Two finish coats over a water repellant preservative and primer.
    - a. Water repellant preservative: treat all surfaces of new wood and exposed, bare areas of existing wood with paintable, water repellant preservative; approved by the primer and finish paint manufacturer for the indicated use.
    - b. Primer: Exterior wood primer for acrylic enamels.
    - c. Finish Coats: Exterior semigloss acrylic enamel.
  - 2. Location:
    - a. Existing refurbished exterior wood and new wood.

3. Color: To be selected to match historic color.
- C. Wood Siding and Trim: Provide the following finish systems over exterior wood siding and trim:
  1. Semigloss (Satin) Acrylic-Enamel Finish: Two finish coats over a water repellant preservative and primer.
    - a. Water repellent preservative: treat all surfaces of new wood and exposed, bare areas of existing wood with paintable, water repellant preservative; approved by the primer and finish paint manufacturer for the indicated use.
    - b. Primer: Exterior wood primer for acrylic enamels.  
or
    - c. Primer (new redwood or cedar): for new redwood or cedar; as back-primer and primer to receive finish coats.
      - 1) Cabot: "Problem Solver Primer".
    - d. Finish Coats: Exterior semigloss (Satin) acrylic enamel.
      - 1) Colors and Sheen: Provide Sheen and multiple custom colors for various siding, trims, windows and doors, to be determined and as selected by the Architect based on analysis of Historic Paint Samples.
  - D. Ferrous Metal: Provide the following finish systems over exterior steel:
    1. Alkyd Gloss Finish: Two finish coats over a primer.
      - a. Primer: Devguard 4160 Multi-Purpose Tank & Structural Primer.
      - b. Finish Coats: Devguard 4308-XXXX Alkyd Gloss Enamel.
        - 1) Color: to be selected.

### **3.8 INTERIOR PAINT SCHEDULE**

- A. Interior Wood (Windows and Trim): Provide the following finish systems over exterior wood:
  1. Semigloss Acrylic-Enamel Finish: Two finish coats over a water repellant preservative and primer.
    - a. Water repellent preservative: treat all surfaces of new wood and exposed, bare areas of existing wood with paintable, water repellant preservative; approved by the primer and finish paint manufacturer for the indicated use.
      - 1) Treat interior of prime wood window sash and frames (only) with water repellant preservative. (Not required for New Interior Storm Window finish.)
    - b. Primer: Interior wood primer for acrylic enamels.

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERANS AFFAIRS

- c. Finish Coats: Interior semigloss acrylic enamel.
- 2. Location:
  - a. Existing refurbished interior wood, windows.
- 3. Color: To be selected to match historic color.

- - - E N D - - -

**SECTION 32 05 23**  
**CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section shall cover site work concrete constructed upon the prepared subgrade and in conformance with the lines, grades, thickness, and cross sections shown. Construction shall include the following:
- B. Pedestrian Pavement: Walks, stairs, stoops and grade slabs.

**1.2 RELATED WORK**

- A. Concrete Materials, Quality, Mixing, Design and Other Requirements: Section 03 30 00, CAST-IN-PLACE-CONCRETE.
- B. Metal Components of Steps (Nosing and Railing): Section 05 50 00, METAL FABRICATIONS.

**1.3 DESIGN REQUIREMENTS**

Design all elements with the latest published version of applicable codes.

**1.4 WEATHER LIMITATIONS**

- A. HOT WEATHER: Follow the recommendations of ACI 305 or as specified to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete. Methods proposed for cooling materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.
- B. COLD WEATHER: Follow the recommendations of ACI 306 or as specified to prevent freezing of concrete and to permit concrete to gain strength properly. Use only the specified non-corrosive, non-chloride accelerator. Do not use calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions. Methods proposed for heating materials and arrangements for protecting concrete shall be made in advance of concrete placement and approved by COR.

**1.5 SELECT SUBBASE MATERIAL JOB-MIX - NOT USED**

**1.6 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
- B. Manufacturers' Certificates and Data certifying that the following materials conform to the requirements specified.
  - 1. Expansion joint filler
  - 2. Hot poured sealing compound
  - 3. Reinforcement

4. Curing materials

**1.7 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. Refer to the latest edition of all referenced Standards and codes.
- B. American Association of State Highway and Transportation Officials (AASHTO):
- M031MM031-07-UL.....Deformed and Plain Carbon-Steel Bars for  
Concrete Reinforcement (ASTM A615/A615M-09)
- M055MM055-09-UL.....Steel Welded Wire Reinforcement, Plain, for  
Concrete (ASTM A185)
- M147-65-UL.....Materials for Aggregate and Soil-Aggregate  
Subbase, Base and Surface Courses (R 2004)
- M148-05-UL.....Liquid Membrane-Forming Compounds for Curing  
Concrete (ASTM C309)
- M171-05-UL.....Sheet Materials for Curing Concrete (ASTM C171)
- M182-05-UL.....Burlap Cloth Made from Jute or Kenaf and Cotton  
Mats
- M213-01-UL.....Preformed Expansion Joint Fillers for Concrete  
Paving and Structural Construction  
(Non-extruding and Resilient Bituminous Type)  
(ASTM D1751)
- M233-86-UL.....Boiled Linseed Oil Mixer for Treatment of  
Portland Cement Concrete
- T099-09-UL.....Moisture-Density Relations of Soils Using a 2.5  
kg. (5.5 lb) Rammer and a 305 mm (12 in.) Drop
- T180-09-UL.....Moisture-Density Relations of Soils Using a 4.54  
kg (10 lb.) Rammer and a 457 mm (18 in.) Drop
- C. American Society for Testing and Materials (ASTM):
- C94/C94M-09.....Ready-Mixed Concrete
- C143/C143M-09.....Slump of Hydraulic Cement Concrete

**PART 2 - PRODUCTS**

**2.1 GENERAL**

Concrete shall be Type C, air-entrained, with the following maximum slump:

<u>TYPE</u>	<u>MAXIMUM SLUMP*</u>
Pedestrian Pavement	75 mm (3")
Equipment Pad	75 to 100 mm (3" to 4")
* For concrete to be vibrated: Slump as determined by ASTM C143. Tolerances as established by ASTM C94.	

## **2.2 REINFORCEMENT**

- A. The type, amount, and locations of steel reinforcement shall be as shown on the drawings and in the specifications.
- B. Welded wire-fabric shall conform to AASHTO M55.
- C. Dowels shall be plain steel bars conforming to AASHTO M31. Tie bars shall be deformed steel bars conforming to AASHTO M31.

## **2.3 SELECT SUBBASE (WHERE REQUIRED) - NOT USED**

## **2.4 FORMS**

- A. Use metal or wood forms that are straight and suitable in cross-section, depth, and strength to resist springing during depositing and consolidating the concrete, for the work involved.
- B. Do not use forms if they vary from a straight line more than 3 mm (1/8 inch) in any 3000 mm (ten foot) long section, in either a horizontal or vertical direction.
- C. Wood forms should be at least 50 mm (2 inches) thick (nominal). Wood forms shall also be free from warp, twist, loose knots, splits, or other defects. Use approved flexible or curved forms for forming radii.

## **2.5 CONCRETE CURING MATERIALS**

- A. Concrete curing materials shall conform to one of the following:
  - 1. Burlap conforming to AASHTO M182 having a weight of 233 grams (seven ounces) or more per square meter (yard) when dry.
  - 2. Impervious Sheeting conforming to AASHTO M171.
  - 3. Liquid Membrane Curing Compound conforming to AASHTO M148 (ASTM C309), Type 1 and shall be free of paraffin or petroleum.

## **2.6 EXPANSION JOINT FILLERS**

Material shall conform to AASHTO M213.

## **PART 3 - EXECUTION**

### **3.1 SUBGRADE PENETRATION - NOT USED**

### **3.2 SELECT SUBBASE (WHERE REQUIRED) - NOT USED**

### **3.3 SETTING FORMS**

- A. Base Support:

1. Compact the base material under the forms true to grade so that, when set, they will be uniformly supported for their entire length at the grade as shown.
2. Correct imperfections or variations in the base material grade by cutting or filling and compacting.

B. Form Setting:

1. Set forms sufficiently in advance of the placing of the concrete to permit the performance and approval of all operations required with and adjacent to the form lines.
2. Set forms to true line and grade and use stakes, clamps, spreaders, and braces to hold them rigidly in place so that the forms and joints are free from play or movement in any direction.
3. Forms shall conform to line and grade with an allowable tolerance of 3 mm (1/8 inch) when checked with a straightedge and shall not deviate from true line by more than 6 mm (1/4 inch) at any point.
4. Do not remove forms until removal will not result in damaged concrete or at such time to facilitate finishing.
5. Clean and oil forms each time they are used.

C. The Contractor's Registered Professional Land Surveyor, specified in Section 00 72 00, GENERAL CONDITIONS, shall establish and control the alignment and the grade elevations of the forms.

1. Make necessary corrections to forms immediately before placing concrete.
2. When any form has been disturbed or any subgrade or subbase has become unstable, reset and recheck the form before placing concrete.

**3.4 EQUIPMENT**

- A. The COR shall approve equipment and tools necessary for handling materials and performing all parts of the work prior to commencement of work.
- B. Maintain equipment and tools in satisfactory working condition at all times.

**3.5 PLACING REINFORCEMENT**

- A. Reinforcement shall be free from dirt, oil, rust, scale or other substances that prevent the bonding of the concrete to the reinforcement.
- B. Before the concrete is placed, the COR shall approve the reinforcement, which shall be accurately and securely fastened in place with suitable supports and ties. The type, amount, and position of the reinforcement shall be as shown.

### **3.6 PLACING CONCRETE - GENERAL**

- A. Obtain approval of the COR before placing concrete.
- B. Remove debris and other foreign material from between the forms before placing concrete. Obtain approval of the COR before placing concrete.
- C. Before the concrete is placed, uniformly moisten the subgrade, base, or subbase appropriately, avoiding puddles of water.
- D. Convey concrete from mixer to final place of deposit by a method which will prevent segregation or loss of ingredients. Deposit concrete so that it requires as little handling as possible.
- E. While being placed, spade or vibrate and compact the concrete with suitable tools to prevent the formation of voids or honeycomb pockets. Vibrate concrete well against forms and along joints. Over-vibration or manipulation causing segregation will not be permitted. Place concrete continuously between joints without bulkheads.
- F. Install a construction joint whenever the placing of concrete is suspended for more than 30 minutes and at the end of each day's work.
- G. Workmen or construction equipment coated with foreign material shall not be permitted to walk or operate in the concrete during placement and finishing operations.

### **3.7 PLACING CONCRETE FOR CURB AND GUTTER, PEDESTRIAN PAVEMENT, AND EQUIPMENT PADS**

- A. Place concrete in the forms in one layer of such thickness that, when compacted and finished, it will conform to the cross section as shown.
- B. Deposit concrete as near to joints as possible without disturbing them but do not dump onto a joint assembly.
- C. After the concrete has been placed in the forms, use a strike-off guided by the side forms to bring the surface to the proper section to be compacted.
- D. Consolidate the concrete thoroughly by tamping and spading, or with approved mechanical finishing equipment.
- E. Finish the surface to grade with a wood or metal float.
- F. All Concrete pads and pavements shall be constructed with sufficient slope to drain properly.

### **3.8 PLACING CONCRETE FOR VEHICULAR PAVEMENT - NOT USED**

### **3.9 CONCRETE FINISHING - GENERAL**

- A. The sequence of operations, unless otherwise indicated, shall be as follows:
  - 1. Consolidating, floating, straight-edging, troweling, texturing, and edging of joints.

2. Maintain finishing equipment and tools in a clean and approved condition.

### **3.10 CONCRETE FINISHING CURB AND GUTTER - NOT USED**

### **3.11 CONCRETE FINISHING PEDESTRIAN PAVEMENT**

#### **A. Walks and Grade Slabs:**

1. Finish the surfaces to grade and cross section with a metal float, trowled smooth and finished with a broom moistened with clear water.
2. Brooming shall be transverse to the line of traffic.
3. Finish all slab edges, including those at formed joints, carefully with an edger having a radius as shown on the Drawings.
4. Unless otherwise indicated, edge the transverse joints before brooming. The brooming shall eliminate the flat surface left by the surface face of the edger. Execute the brooming so that the corrugation, thus produced, will be uniform in appearance and not more than 2 mm (1/16 inch) in depth.
5. The completed surface shall be uniform in color and free of surface blemishes, form marks, and tool marks. The finished surface of the pavement shall not vary more than 5 mm (3/16 inch) when tested with a 3000 mm (10 foot) straightedge.
6. The thickness of the pavement shall not vary more than 6 mm (1/4 inch).
7. Remove and reconstruct irregularities exceeding the above for the full length between regularly scheduled joints.

### **3.12 CONCRETE FINISHING FOR VEHICULAR PAVEMENT - NOT USED**

### **3.13 CONCRETE FINISHING EQUIPMENT PADS - NOT USED**

### **3.14 JOINTS - GENERAL**

- A. Place joints, where shown, conforming to the details as shown, and perpendicular to the finished grade of the concrete surface.
- B. Joints shall be straight and continuous from edge to edge of the pavement.

### **3.15 CONTRACTION JOINTS**

- A. Cut joints to depth as shown with a grooving tool or jointer of a radius as shown or by sawing with a blade producing the required width and depth.
- B. Finish edges of all joints with an edging tool having the radius as shown.
- C. Score pedestrian pavement with a standard grooving tool or jointer.

### **3.16 EXPANSION JOINTS**

- A. Use a preformed expansion joint filler material of the thickness as shown to form expansion joints.
- B. Material shall extend the full depth of concrete, cut and shaped to the cross section as shown, except that top edges of joint filler shall be below the finished concrete surface where shown to allow for sealing.
- C. Anchor with approved devices to prevent displacing during placing and finishing operations.
- D. Round the edges of joints with an edging tool.
- E. Form expansion joints as follows:
  - 1. Without dowels, about structures and features that project through, into, or against any site work concrete construction.
  - 2. Using joint filler of the type, thickness, and width as shown.
  - 3. Installed in such a manner as to form a complete, uniform separation between the structure and the site work concrete item.

### **3.17 CONSTRUCTION JOINTS**

- A. Place transverse construction joints of the type shown, where indicated and whenever the placing of concrete is suspended for more than 30 minutes.

### **3.18 FORM REMOVAL**

- A. Forms shall remain in place at least 12 hours after the concrete has been placed. Remove forms without injuring the concrete.
- B. Do not use bars or heavy tools against the concrete in removing the forms. Promptly repair any concrete found defective after form removal.

### **3.19 CURING OF CONCRETE**

- A. Cure concrete by one of the following methods appropriate to the weather conditions and local construction practices, against loss of moisture, and rapid temperature changes for at least seven days from the beginning of the curing operation. Protect unhardened concrete from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready to install before actual concrete placement begins. Provide protection as necessary to prevent cracking of the pavement due to temperature changes during the curing period. If any selected method of curing does not afford the proper curing and protection against concrete cracking, remove and replace the damaged pavement and employ another method of curing as directed by the COR.

- B. Burlap Mat: Provide a minimum of two layers kept saturated with water for the curing period. Mats shall overlap each other at least 150 mm (6 inches).
- C. Impervious Sheeting: Use waterproof paper, polyethylene-coated burlap, or polyethylene sheeting. Polyethylene shall be at least 0.1 mm (4 mils) in thickness. Wet the entire exposed concrete surface with a fine spray of water and then cover with the sheeting material. Sheets shall overlap each other at least 300 mm (12 inches). Securely anchor sheeting.
- D. Liquid Membrane Curing:
  - 1. Apply pigmented membrane-forming curing compound in two coats at right angles to each other at a rate of 5 m<sup>2</sup>/L (200 square feet per gallon) for both coats.
  - 2. Do not allow the concrete to dry before the application of the membrane.
  - 3. Cure joints designated to be sealed by inserting moistened paper or fiber rope or covering with waterproof paper prior to application of the curing compound, in a manner to prevent the curing compound entering the joint.
  - 4. Immediately re-spray any area covered with curing compound and damaged during the curing period.

### **3.20 CLEANING**

- A. After completion of the curing period:
  - 1. Remove the curing material (other than liquid membrane).
  - 2. Sweep the concrete clean.
  - 3. After removal of all foreign matter from the joints, seal joints as herein specified.
  - 4. Clean the entire concrete of all debris and construction equipment as soon as curing and sealing of joints has been completed.

### **3.21 PROTECTION**

The contractor shall protect the concrete against all damage prior to final acceptance by the Government. Remove concrete containing excessive cracking, fractures, spalling, or other defects and reconstruct the entire section between regularly scheduled joints, when directed by the COR, and at no additional cost to the Government. Exclude traffic from vehicular pavement until the concrete is at least seven days old, or for a longer period of time if so directed by the COR.

### **3.22 FINAL CLEAN-UP**

Remove all debris, rubbish and excess material from the VA Medical Center Property.

CLEMENT J. ZABLOCKI MEDICAL CENTER  
MILWAUKEE, WI  
BUILDING 6 FCA DEFICIENCY CORRECTIONS  
VA PROJECT: 695-13-111

DEPARTMENT OF VETERAN AFFAIRS

04-10

- - E N D - - -